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THE ECONOMIC STABILITY OF AMERICAN AGRICULTURE

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EXISTING beliefs with regard to economic fluctuations are in sharp contrast with those on efficiency with no illusion that all has been going well. In agriculture, for one reason or another, the farm problem, so much in the forefront during the interwar years, has been associated altogether too largely with economic instability.¹ The notion lingers that the production of food is still a matter of feast or famine as it was of old, and as it still is in most of the less developed countries. Wars, booms, and depressions have focused attention on the gyrations of farm prices, at one stage rising and soaring abruptly to absurd heights and at another falling to unbelievable depths. Farm people are at one time the recipients of large unexpected windfalls, and at another suffer losses bringing about widespread bankruptcy. Yet oddly enough there also is the view that hard times may come and go without seriously affecting farm people, for they, it is often presumed above all other groups, are always secure in having enough food, fuel and shelter.

This mixture of beliefs is also characteristic of the thinking in economics when it comes to agriculture. More important, however, is the fact that no general principles have been established for analyzing the problem of instability, principles that are on a footing

* The tables in this paper were prepared by Dale Knight. In revising an earlier draft of this paper, I am indebted to O. H. Brownlee, R. K. Froker, D. Gale Johnson, D. L. MacFarlane, F. V. Waugh, and H. R. Wellman for valuable suggestions.

¹ As a consequence there has been a tendency to overlook (a) the long run allocative inefficiency characteristics of so much of agriculture; (on this aspect see my paper "How Efficient is American Agriculture?" this JOURNAL, August, 1947). (b) the inequality in incomes within agriculture, (c) the inadequacy of farm tenure and other institutions.

with those employed in ascertaining whether an optimum utilization of resources is achieved in the long run. The analytical tools with which economists work have not been designed to handle problems of the type on which we are focusing, that is, for *dealing with the short and sudden fluctuations of the main economic aggregates*. Accordingly, we do not have at hand the concepts or theory for formulating the problem, for identifying its primary characteristics, and for making an analysis. Economic theory in this sphere is in general unsettled; several schools of thought hold forth but none has had the strength to win the field.²

Let us start with the query: What do we mean by economic instability? One important line of inquiry is to determine whether a given economic system has the capacity to work its way back toward an equilibrium³ after a particular type of disequilibrium has occurred. Another approach begins with the presupposition that the economic system does have the capacity to equilibrate and seeks to find out how far given movements will go before the equilibrating forces become effective. Still another approach starts from the belief that the movements of the main economic aggregates are too great (presumably too "costly") before the equilibrating capacity takes hold, and endeavors to discover how to enhance the capacity of the economic system to achieve greater stability. In this paper we shall have occasion to direct attention to unsettled issues falling in one or the other of these three categories.

Given the existing state of our knowledge we can only speculate with regard to the economic magnitudes likely to prove significant and useful in analyzing the problem of economic instability as related to agriculture. Production, prices, and income undoubtedly have a high priority from a policy point of view. They certainly will provide a clew to certain types of instability, although none of them will give any clear and definite notion of the "cost" of the

² Two remarks are called for at this point. (1) Although the analytical equipment for ascertaining economic efficiency is firmly established, it nevertheless is exceedingly abstract and as yet when applied yields results that are usually of limited usefulness. Accordingly, it is easy to claim too much for analyses dealing with economic efficiency; (2) an awkward gap exists between equilibrium theory based on the rationality of firm and household behavior and fluctuation or cycle theory. This is the gap that separates the *micro*-economics of firms and households and the *macro*-economics of aggregates. (See Professor J. Marschaks comments on this point, "A Cross Section of Business Cycle Discussion." *The American Economic Review*, vol. 35, 1945.)

³ By equilibrium in this context I mean achieving full employment at essentially stable prices.

instability thus identified.⁴ Nor will these magnitudes necessarily tell us how to proceed to counteract the fluctuations, nor will they explain why they occur. Nevertheless, a crude, first approximation of the nature of the instability problem confronting agriculture in this sphere may be achieved by examining their movements.

Production. To achieve full employment⁵ and maintain it is a policy objective that has high priority. It is so because of the social necessity of avoiding mass unemployment. No doubt the most serious social consequence of our unstable economy arises from its erratic production that has come to characterize many major industries. But agriculture is not one of them.⁶ Agricultural output

⁴ These "costs" are nevertheless large and important as we will show below in the case of marketing. Given the existing instability in farm prices and incomes, the market for farm products is not permitted to function efficiently. In agricultural production the chief costs are in terms of adverse effects on allocative efficiency arising from mistaken expectations and failure of alternatives to present themselves. In addition there is a cost in the fluctuations in income to the individual income recipients.

⁵ Although much has been said on the term "full employment," the concept is still chiefly a political goal very loosely visualized. To make headway it is necessary to put it into a policy context so that it may be more useful in dealing with significant public policy issues. To do this, several steps are required. At this stage of our knowledge regarding the cycle and the way an economy develops, "full employment" is at best a relative concept and not some absolute amount of employment. In broad outlines there are two different policy settings for which we should formulate the concept of full employment. One of these, on which virtually all of the current discussions appears to focus, has to do with the cycle, that is, with the sharp and sudden fluctuations in aggregate demand. When demand becomes markedly deficient, deflation and too little employment occur and when it becomes excessive, inflation in terms of factor and product prices follows. As yet we are not able to identify satisfactorily when either of these situations is beginning to occur.

The second policy setting takes us back to the longer run allocative efficiency of a developing economy giving rise to conditions where the expanding sectors of the economy are likely to engage too few resources (over-employment of the resources already devoted to such production) and where the contrasting sectors use too many resources (under-employment of the resources being used). It would simplify matters greatly if these two sets of circumstances were neatly separated, but unfortunately they occur all bundled together. To illustrate, late in 1946 and early in 1947 the early post-war transition, driven by very swollen demands for goods and services, gave rise to a marked inflation and too much employment demand in the dominating sectors of business in a short-run cyclical context. As this excessive employment materialized there existed at the same time considerable under-employment in a long run context because several million workers, especially in Southern agriculture, continued to remain grossly under-employed because of the excessive supply of labor in farming in that area, a problem of long standing.

⁶ For a meticulous treatment of the cyclical characteristics of selected business activities see Arthur F. Burns and Wesley C. Mitchell, *Measuring Business Cycles*, National Bureau of Economic Research, 1946. This study, however, omits agriculture. For reference to more recent work in this area by the National Bureau see my remarks in footnote 12 bearing on the study of Geoffrey H. Moore on *Harvest Cycles*. See also John K. Galbraith and John D. Black, "The Maintenance of Agricultural Production During Depression: The Explanations Reviewed," *The Journal of Political Economy*, Vol. 46 (1938).

is not afflicted by the "business" cycle virus. The following data give some clew to this difference in agricultural and industrial production on this score.

Change in production from the preceding year (in percent)	Agricultural production ^a 1910-1946 (Number of years)	Industrial production ^b 1919-1945 (Number of years)
+26 to +30	—	2
+21 to +25	—	3
+16 to +20	—	4
+11 to +15	1	2
+ 6 to +10	4	4
0 to \pm 5	29	4
- 6 to -10	2	1
-11 to -15	—	1
-16 to -20	—	2
-21 to -25	—	3
Average variation (in percent)	3.9	15.0

^a This is based on the USDA regular production index of production for sale and consumption. It gives the best measure of the current year volume of farm products which enter the marketing system and thus contribute to gross cash or realized farm income. See USDA *Farm Production in War and Peace*, F. M. 53 by Glen T. Barton, and Martin R. Cooper, 1945. Especially p. 66 to 71.

^b From Federal Reserve Board Bulletin.

It is obvious from an inspection of these data that American agricultural production *taken as a whole* is remarkably stable. Only twice during the last three and a half decades did aggregate output fall more than 5 percent from the preceding year, namely 10 percent in 1921 and 6 percent in 1932. In both cases the drop was caused by what happened in crops, for livestock output stayed almost constant. The sharp depression of 1920-21 may have been a minor factor although the total crop acreage did not change appreciably,⁷ suggesting that a drop in yields was the main cause. In the other case, the crop acreage actually increased between 4 and 5 million acres. Accordingly it is hard to ascribe even these relatively small decreases to the downward shift in aggregate demand.⁸

⁷ See p. 84 of the 1924 *Yearbook of Agriculture*. Total crop acreage in 1920 was 347,634,000, and 1921, 348,178,000.

⁸ It should not go unnoticed that neither the 1934 nor the 1936 drought pulled aggregate agricultural production (for sale and consumption) down as much as six per cent from that of the preceding year. Note, however, that the new index (see below) measuring gross farm production shows a marked drop for these years.

Change in production from preceding year (in percent)	All farm commodities (No. of years)	All livestock and livestock products (No. of years)	All crops (No. of years)
+16 and more	—	—	3
+11 to +15	1	—	5
+ 6 to +10	4	7	5
from 0 to ± 5	29	27	12
— 6 to —10	2	1	6
—11 to —15	—	1 ^a	4 ^b
—16 and less	—	—	1 ^c
Average variation (in percent)	3.9	3.6	9.5

^a 1935; ^b 1913, 1916, 1932, and 1934; ^c 1921 dropped 22 percent.

These data seem to support the following tentative inferences:

- (1) The aggregate output of American agriculture is, if anything, conspicuously stable;
- (2) It is not affected adversely in the short run by a drop in aggregate demand such as occurred in 1920–21, 1930–33, and 1937–38;
- (3) Nor, contrary to general opinion, is the aggregate output of agriculture affected substantially from year to year by changes in weather; and
- (4) The aggregate production effort (input of resources) in agriculture is probably even more stable than is the aggregate output (production for sale and consumption).

It may be observed that the aggregate output of agriculture in the United States provides consumers about the same volume of farm products during a depression as in prosperous years; that "big crops" do not come along to "help" business recover from a depression; that attempts to make agricultural production a variable, even on such a colossal scale as that of the AAA in the 'thirties, did not reduce agricultural output as a whole; and that the adverse effects of business depressions creep into agriculture and seriously upset prices and income but not production as a whole. Thus far, at least, farmers have not responded to a cyclical decline in the aggregate demand for farm products by curtailing the employment of land and labor.⁹

⁹ There is need for inquiry on this point to ascertain (1) the nature of the supply response of producers of farm products to cyclical changes in demand, (2) types of responses that characterize different producers, and (3) the economic rationale underlying the production decisions of producers in response to the cycle.

This does pose a significant issue: why is the aggregate output of agriculture in the United States so stable, despite the vagaries of weather and of business cycles? More particularly in this context, why is agriculture so immune to the cycle virus? If we can identify the causes for this immunity, may it not suggest an antitoxin for what now plagues so much of our non-agricultural economy?

If these observations create the impression that each of the several parts of agriculture also has a stable production record, it needs to be corrected. In fact, agricultural production as an aggregate hides a lot of "costly" variability, so much that one might well ask what meaning can be attached to the aggregate. The Bureau of Agricultural Economics (Glen T. Barton and Martin F. Cooper already cited) has developed a set of indices for *gross farm production* by geographic regions which show three regions (New England, Pacific, and Middle Atlantic) with average mean deviations from 3.2 to 4.4 percent; four additional regions (East North Central, Mountain, South Atlantic and East South Central) falling between 6.7 and 8.1 percent; and the West North Central at 10.7 percent with the West South Central having the most extreme record, namely a mean average deviation of 11.7 percent. The year to year variations in gross farm production from 1919 to 1945 are given in the table on the next page.

It is also plain from the data that follow that particular farm products are far from stable in output. Moreover, these fluctuations give rise to specific problems. These fluctuations in product output are mainly caused by variations in yields. The situation in feed crops is striking, and because of the importance of feed in the agricultural economy of the United States there is a strong presumption that it deserves serious attention. Furthermore, it should be noted that although the aggregate output of agriculture is notably stable, a fortunate situation from the point of view of the economy as a whole, the variations in production on individual farms is a basic consideration to the farm family concerned. These variations from farm to farm are obviously hidden by a national average. We may presume, however, that in the main they are not caused by the periodic rise and fall of the aggregate demand but by technical production circumstances such as weather, disease, insects, damage and others.

It may well be true that a few particular products will, upon closer analysis, show expansion and contraction characteristics over

Change in gross farm production from preceding year (in percent)	United States	New England	Pacific	Middle Atlantic	East North Central	Mountain	South Atlantic	East South Central	West North Central	West South Central
(Number of years)										
+31 and more	—	—	—	—	—	—	—	—	2	2
+21 to +30	1	—	—	—	2	—	—	2	—	1
+16 to +20	1	—	—	—	1	1	1	—	1	1
+11 to +15	—	—	1	1	—	2	4	1	1	2
+ 6 to +10	3	3	5	4	4	7	4	5	5	4
0 to \pm 5	17	19	18	16	12	10	11	10	10	5
- 6 to -10	3	3	—	3	4	3	3	3	3	5
-11 to -15	1 ^a	—	1 ^b	1 ^c	2 ^d	2 ^e	—	3 ^a	—	3 ^l
-16 to -20	—	—	—	—	—	—	2 ^f	1 ^b	1 ⁱ	1 ^m
-21 to -30	—	—	—	—	—	—	—	—	1 ^j	1 ⁿ
-31 and less	—	—	—	—	—	—	—	—	1 ^k	—
Average deviation (in percent)	5.5	3.2	4.4	4.4	6.7	6.8	7.7	8.1	10.7	11.7

^a 1934; ^b 1924; ^c 1921; ^d 1933, 1936; ^e 1933; ^f 1921, 1932; ^g 1927, 1930, 1938; ^h 1932; ⁱ 1933; ^j 1936; ^k 1934; ^l 1927, 1933, 1938; ^m 1921; ⁿ 1934.

Data for regions are for the period 1919 to 1944, for the United States from 1919 to 1945. Source: *op. cit.* Barton and Cooper, pp. 73-83.

the cycle akin to those of industry. The principal policy consideration for agriculture taken as a whole, however, is not one of achieving tolerable production stability but to maintain that which has developed.

Prices. How unstable are farm product and factor prices? To give this query meaning it is necessary to indicate what it is we want the price system to achieve and what are the criteria for identifying this achievement. In an economic context prices have an important and unique role to perform in connection with the valuation of products and factors.¹⁰

¹⁰ The remainder of this section deals with markets for farm products. Markets for factors employed in farming—land, labor, equipment, machinery, materials, etc.—also present problems in terms of stability. Booms and busts in land prices is an old story in the United States. More recently wars and their aftermath have introduced marked instability in the land market. Wage rates in agriculture are about as variable as is the income from farming. To my knowledge no attempt has been made to ascertain how efficiently the *factor markets* serving agriculture function. The criteria for determining efficiency in this context have not been developed. In general, however, this much seems obvious: These factor markets are important; they appear to be unstable cyclewise and especially in going from peace to war to

Our quest is for an efficient pricing system, efficient in performing several functions that integrate major economic processes. As policy with regard to farm prices has taken shape, four fairly distinct functions have come to the fore-front, namely: (1) prices to guide the allocation of resources in production; (2) prices to channel products into trade both at home and abroad; (3) prices to distribute income from farming over time, and (4) prices to distribute income among persons.

Can a pricing system be "efficient" in all of these functions at one and the same time? Are we not putting altogether too big a burden on the pricing system and thereby weakening it and making it less efficient than it otherwise would be in performing the more limited tasks that are appropriate to its capacity? The answer to the latter question appears to be strongly in the affirmative, both on theoretical grounds and from the lessons taught to us by experience.

Let me make explicit at this point that the formulation of the pricing problem that follows is based on the belief that prices are not an appropriate means for "stabilizing" the income from farming over time, and also that they are not suited to lessen the

peace; they have been quite inefficient over the years in bringing about factor equilibrium for the economy as a whole in view of the great excess of labor resources embedded in farming and the substantial deficit of capital that characterizes much of agriculture. Some insight with regard to the fluctuations of factor prices of agriculture is to be had from the following data:

PRICE CHANGES OF FACTORS USED IN AGRICULTURE, 1910-1945

Price Change from Preceding Year (in percent)	Farm Machinery	Equipment and Supplies	Land (value per acre)	Prices paid in Production	Fertilizer	Bldg. Mat'l Other Than House	Labor Weighted Average Rate per Month	Land (Gross Rent to Landlords)
	(Number of years)							
+31 and above	1	2	1	1	1	—	2	2
+21 to +30	—	1	—	1	—	—	3	2
+16 to +20	—	—	—	1	3	3	3	2
+11 to +15	1	—	1	3	3	2	4	5
+6 to +10	—	4	5	5	7	7	4	6
0 to ±5	32	24	20	20	19	19	15	11
—6 to —10	—	2	2	2	2	2	1	—
—11 to —15	1	1	1	2	1	1	1	1
—16 to —20	—	1	2	1	2	—	—	1
—21 to —30	—	—	—	—	—	1 ^a	2 ^b	3 ^d
—31 and less	—	—	—	—	—	—	1 ^c	1 ^e
Average deviation (in percent)	3.5	5.4	5.9	6.7	6.1	6.2	11.1	13.2

^a 1921; ^b 1931, 1932; ^c 1921; ^d 1920, 1921, 1932; ^e 1931.

TABLE I

THE FOLLOWING DATA FOCUS ATTENTION ON THE YEAR TO YEAR CHANGES IN AGRICULTURAL PRODUCTION OF
SELECTED MAJOR PRODUCTS:

(from 1910 to 1946 except for sheep, lambs and hogs which cover the years from 1910 to 1945)

Changes in production from preceding year (in percent)	Dairy prod- ucts	Poul- try and eggs	Cattle and calves	Meat ani- mals	Sheep and lambs	Hogs	Wheat	Food grains	Corn	Fruits and tree nuts	To- bacco	Cotton	Oil bear- ing crops	Pota- toes	Feed crops
+31 and more	—	—	—	—	—	—	2	2	2	4	4	3	8	2	3
+21 to +30	—	—	—	—	1	3	2	5	2	3	2	2	3	3	5
+16 to +20	—	1	—	—	1	2	4	1	3	2	2	3	3	3	0
+11 to +15	—	1	—	4	2	3	2	2	5	2	5	4	2	4	2
+ 6 to +10	—	8	8	9	6	2	3	4	3	5	4	4	4	2	7
from 0 to ± 5	36	25	22	18	18	18	14	11	9	7	7	7	5	5	4
- 6 to -10	—	1	4	4	4	4	1	3	3	5	3	3	2	5	3
-11 to -15	—	—	1	—	2	1	3	1	2	3	3	3	3	6	3
-16 to -20	—	—	—	—	1	1	2	5	3	1	2	—	2	3	4
-21 to -30	—	—	—	1	—	1	2	1	2	3	2	5	2	2	3
-31 and less	—	—	—	—	—	—	1	1	2	1	2	2	2	—	2
Average deviation (in percent)	2.1	4.1	4.6	5.9	6.7	8.6	13.1	14.5	16.1	16.2	15.3	16.2	22.5	14.5	21.4

inequality in the personal distribution of incomes. Moreover, I shall assume that the main positive role of the pricing system is to guide production and to channel products into trade for domestic and foreign use. To take still another step, given the existing state of our political economy—chiefly the prevailing attitudes toward economic policy, the nature and capacity of economic institutions, and the type of development that characterizes our economy—it is my belief that that part of the pricing system on which agriculture depends most directly *will not be permitted* (politically and institutionally) to perform its production and marketing functions efficiently, unless ways and means are first found (1) to make the flow of farm income much steadier than it has been from one year to another and (2) to reduce substantially the inequality in income among families. The first of these is, politically, much the more urgent of the two. Plainly we have come out of the interwar period and the late war with a price policy for agriculture designed primarily to attain the objective of stabilizing farm incomes over time. If this appraisal proves to be correct, it follows that a high priority should be given to inquiry for finding ways and means that will free the pricing system from the two income burdens described above, especially that of putting the flow of farm income on a steadier basis.

Let us then proceed by leaving the income problems aside which means that we shall assume at this point that the pricing system is freed so that it can concentrate on the first two functions outlined above, namely guide agricultural production and channel farm products among their various uses—How efficient would such a pricing system be? When put this way, there is still a strong presumption, in my judgment, that the pricing system would prove to be quite inefficient under conditions of the kind that have prevailed since 1910–1914.

This takes us to the heart of the difficulty because there can be little doubt that it has been the unstable character of the economy that has undermined the pricing system. In its simplest terms what appears to have been happening has been a breaking apart of the network of prices connecting the decisions to utilize resources for production and the decisions to utilize products for consumption. This separation has come about as a result of inconsistencies that have emerged between the long and the short run when the aggregates of an economy are fluctuating widely. The commitments with regard to factors to achieve allocative efficiency in farming involve

production plans that are essentially long run in nature relative to the kind of commitments that arise when processors and other handlers buy farm products with a view of marketing them to consumers. In an economy with a steady rate of development and with relatively little economic uncertainty—like the years,¹¹ say, from 1895 up to World War I—these two sets of decisions may be sufficiently integrated by the pricing system to give satisfactory results, results approximating the economist norm based on a stationary state in equilibrium. Since 1910–1914, however, the economy has been so unstable, economic uncertainty has bulked so large, and the fluctuations in farm prices¹² have been so violent and

¹¹ It is significant that the *peaks and troughs* of the business cycles that Burns and Mitchell identify (in *Measuring Business Cycles*, Appendix A, Table A1) do not appear to have been important in farm price changes that occurred during the period 1894 to 1915:

	Stage of cycle	Index of farm product prices ^a
1894 (May, June, July)	Trough	60
1895 (Nov., Dec. & Jan. 1896)	Peak	59
1897 (May, June, July)	Trough	57
1899 (May, June, July)	Peak	61
1900 (Nov., Dec. & Jan. 1901)	Trough	74
1902 (Aug., Sept., Oct.)	Peak	82
1904 (July, Aug., Sept.)	Trough	81
1907 (Apr., May, June)	Peak	86
1908 (May, June, July)	Trough	87
1909 (Dec. & Jan., Feb. 1910)	Peak	107
1911 (Dec. & Jan., Feb. 1912)	Trough	97
1912 (Dec. & Jan., Feb. 1913)	Peak	99
1914 (Nov., Dec. & Jan. 1915)	Trough	98

^a Warren and Pearson, *Cornell Memoir* 142.

¹² Again taking the *peaks and troughs* of business cycles from Burns and Mitchell and relating these to changes in farm prices the wide swings appear to be very close:

	Stage of cycle ^a	Index of farm prices ^b
1914 (Nov., Dec. & Jan. 1915)	Trough	98
1918 (July, Aug., Sept.)	Peak	207
1919 (March, Apr., May)	Trough	210
1919 (Dec., Jan. & Feb. 1920)	Peak	227
1921 (Aug., Sept., Oct.)	Trough	128
1923 (Apr., May, June)	Peak	142
1924 (June, July, Aug.)	Trough	140
1926 (Sept., Oct., Nov.)	Peak	142
1927 (Nov., Dec. & Jan. 1928)	Trough	151
1929 (May, June, July)	Peak	146
1933 (Feb., Mar., Apr.)	Trough	59
1937 (Apr., May, June)	Peak	128

^a *Measuring Business Cycles*, Appendix A, Table A1.

^b U.S.D.A. Index numbers of Prices Received by Farmers, 1910–1943. Washington, D. C., Feb. 1944.

After completing this paper I have had the privilege of reading Geoffrey H.

great that the pricing system could not integrate these two sets of decisions. As a consequence a gap has appeared in the network of prices. In short, conditions have been such that the pricing system has not been able to guide the allocative process in production efficiently and at the same time keep farm products moving into foreign and domestic markets at a rate consistent with short run developments.

Before turning to lines of inquiry that this formulation calls for, it will be useful to examine briefly some data showing the few, small changes in agricultural production compared to many large changes that have occurred in farm prices. The data that follow are based on changes from the preceding year:

Change from preceding year (in percent)	Agricultural production 1910-1946 (No. of years)	All farm commodity prices 1910-1946 (No. of years)	Crop prices 1910-1946 (No. of years)	Livestock and livestock production prices 1910-1946 (No. of years)
+31 and more	—	2	3	2
+21 to +30	—	5	2	2
+16 to +20	—	2	2	4
+11 to +15	1	1	4	2
+ 6 to +10	4	6	4	5
from 0 to ± 5	29	14	14	14
- 6 to -10	2	2	1	1
-11 to -15	—	1	2	2
-16 to -20	—	—	—	1
-21 to -30	—	2 ^a	2 ^c	2 ^e
-31 and less	—	1 ^b	2 ^d	1 ^f
Average variation (in percent)	3.9	12.3	14.2	12.0

^a 1931, 1932; ^b 1921; ^c 1932, 1938; ^d 1921, 1931; ^e 1931, 1932; ^f 1921.

Moore's Ph.D. thesis, *Harvest Cycles*, growing out of his researches with the National Bureau of Economic Research. I wish to call attention to Moore's findings by drawing briefly upon Chapter III of his thesis as follows: "... we can safely conclude that cyclical changes in business conditions are, on the average, a relatively unimportant cause of changes in the output of most of the more important crops in the four countries, or of total crop production in each country" (Ch. III, p. 2). As to prices Moore points out "There is striking evidence in our materials that crop prices have consistently been deflated in severe business contractions and inflated in vigorous expansions, in the 19th as well as in the 20th century" (Ch. III, p. 24). "However... declines in crop prices tend to predominate in mild business expansions and rises to predominate in both mild and moderate contractions" (Ch. III, p. 29.)

At this point several tentative views with regard to farm prices and their instability may be indicated with the view that these may serve, at least, as working hypotheses for inquiry into this field.

1. The principal policy objective in this sphere should be to develop an efficient pricing system, efficient in performing two major functions, that of guiding allocative decisions in agricultural production and that of channeling farm products to consumers.
2. The pricing system is not an appropriate means for stabilizing income from farming over time. To place this burden on the pricing system, as has been done in recent years, can only reduce greatly its capacity to perform the two functions for which it is an appropriate means. Improving the personal distribution of income among families and more especially its distribution over time, need to be achieved by means other than prices.
3. Under fairly stable economic conditions (such as appeared to have prevailed from about 1895 to 1915, for example) the pricing system may succeed to integrate its two major functions.
4. Under distinctly unstable conditions (such as have been occurring since World War I for instance) the pricing system loses its capacity to integrate the relatively long run production decisions and the comparatively short run decisions involved in the distribution and marketing of farm products.
5. To avoid this disintegration of the pricing system the first lines of defense are measures that will counteract business cycles and wars. This is, however, a big order and meanwhile other measures need to be developed to keep the pricing system from disintegrating under unstable economic conditions.
6. This formulation indicates that it may prove necessary, under unstable economic conditions to approach the two functions

"... The positive conformity of crop prices in long and violent business cycles is unquestionably a demand phenomenon" (Ch. III, p. 35). Moore asks why should crop prices have an inverted relation to the mild cycle, but he does not find a satisfactory answer although he sees a clew in changes in world crops relative to domestic crops. Moore also finds that, "specific cycles in crop harvests pursue their courses almost entirely free of the influence of business cycles" (Ch. III, p. 65).

The Twenty-Seventh Annual Report of the National Bureau, *Stepping Stones Towards the Future*, Arthur F. Burns, March, 1947, pp. 42-46, includes a short statement on agriculture prepared by Geoffrey H. Moore.

TABLE II
(The period covered is from 1910 to 1946 except cattle and calves, hay, corn, sheep and lambs, wheat and potatoes, which are for 1910 to 1945)

Changes in price (in percent)	Dairy products	Milk, wholesale	Livestock and livestock products	All crops	All commodities	Meat animals	Feed crops	Poultry and eggs	Cotton	Tobacco	Fruits and tree nuts	Cattle and calves	Eggs	Hay	Corn	Sheep and lambs	Food grains	Wheat	Hogs	Oil bearing crops	Potatoes
+31 and more	1	2	2	3	3	3	3	1	10	5	3	1	1	3	3	2	4	4	5	7	11
+21 to +30	2	1	2	2	5	3	4	4	—	5	2	3	5	3	6	1	3	3	2	—	2
+16 to +20	4	5	4	2	2	1	1	2	—	1	5	3	1	2	1	—	2	1	—	—	—
+11 to +15	3	2	2	4	1	6	6	4	1	1	3	4	5	2	4	5	5	5	4	4	3
+6 to +10	4	5	5	4	6	2	3	4	3	2	3	4	4	5	5	7	5	4	6	6	1
from 0 to ± 5	15	14	14	14	14	12	11	11	10	10	10	10	9	9	7	7	6	6	5	5	3
-6 to -10	2	2	1	1	2	2	1	3	—	1	2	3	2	5	3	3	2	2	2	3	3
-11 to -15	2	2	2	2	1	1	1	3	4	5	2	1	5	2	1	—	4	5	2	2	1
-16 to -20	—	—	—	—	—	3	—	2	1	4	4	1	1	2	—	3	1	1	4	2	—
-21 to -30	3	3	2	2	2	1	1	2	2	4	—	2	2	2	1	1	1	1	2	3	4
-31 and less	—	—	1	2	1	2	4	—	4	—	2	1	1	1	4	2	3	3	3	2	7
Average deviation (in percent)	10.2	11.6	12.0	14.2	12.3	15.1	17.8	12.2	22.1	18.2	15.6	13.1	13.2	13.9	21.0	15.2	17.9	18.0	22.1	20.6	35.2

that are properly the tasks of the pricing system separately, and develop for each appropriate policies and institutions, on the one hand, to guide the allocative process in agricultural production efficiently by such means as forward pricing and other new institutions to lessen the price uncertainty impinging upon farmers;¹³ and on the other hand, to channel farm products into markets at home and abroad by freeing market prices.

Income. American agriculture, undoubtedly, is subject to many different kinds of instability, yet be it war or peace, business or weather, price or yield, the principal policy objective has been to reduce the instability of income from farming over time.¹⁴ This objective focusing on income has not always been explicit—it nevertheless is the key to most of agricultural policy. It is evident in the political support for the McNary-Haugen proposals, the Federal Farm Board and the array of New Deal farm programs. Production control was advanced in the early 'thirties as necessary to adjust output to depressed and shrunken demand. As the limitations of production control became apparent, the emphasis shifted largely to measures to maintain farm prices—commodity loans for the "basic commodities" dramatized as the Ever-Normal Granary after the drastic droughts of 1934 and 1936; following this came price supports to mobilize agricultural production for war and to protect farmers during the transition. Throughout all of these efforts, like a red thread, runs the objective of stabilizing the income from farming over time.

There is no denying that income from farming has been extraordinarily unstable during the last three and a half decades, more unstable than farm prices. The following data make this quite evident:

1. Comparing agricultural and non-agricultural¹⁵ changes in production, prices and income from the preceding year since World War I

¹³ See D. Gale Johnson, *Forward Prices for Agriculture*, University of Chicago Press, 1947.

¹⁴ In this paper I do not consider several types of income instability of importance to individual farmers, namely that arising from variations in yields, inaccurate price expectations, and long run changes in supply of and demand for farm products.

¹⁵ See also Table XX, page 214, "Cyclical Movements in 'per capita' Farm and Non-Farm Income," in my book *Agriculture in an Unstable Economy*, McGraw-Hill, 1945.

	Agricultural production	Non-agricultural prices	Non-agricultural income	Agricultural prices	Agricultural income	Non-agricultural production
Average annual deviation in per- cent	3.9	7.3	11.2	12.3	14.0	15.0

2. Changes in income from preceding year

Changes in percent	Non-agricultural income (1910 to 1944)	Agricultural income excluding govt. payments (1910 to 1945)
+30 and more	—	3
+21 to -30	2	3
+16 to -20	6	2
+11 to -15	4	3
+ 6 to -10	8	7
from 0 to ± 5	8	11
- 6 to -10	2	—
-11 to -15	1	2
-16 to -20	2	1
-21 to -30	1	1
-31 and less	—	2
Average deviation (in percent)	11.2	14.0

3. The income instability for groups of farm products and for major products, again in terms of changes from the preceding year are given in some detail below: (see figures in Table III).

The income problem of course has several different facets. The income in many parts of agriculture is very low, a problem that is closely intertwined with the low efficiency characteristic of so much of agriculture outlined in some detail in my previous paper. The wide inequalities in the personal distribution of income also present basic difficulties because of its bearing upon the widespread sub-standard medical, hospital, housing, and educational facilities and poor diets that prevail. The very uneven distribution of income over time is still another acute problem in agriculture. It is this characteristic of income from farming on which we have been focusing. Our concern, moreover, has been restricted to that over-all instability in farm income originating out of the short and sudden fluctuations of the main economic aggregates attributable to the

TABLE III

(Period covered is from 1910 to 1945 except for cattle and calves, eggs, sheep and lambs, wheat, potatoes and corn, which cover 1910 to 1944)

Changes in income (in percent)	Dairy products	Meat animals	Fruits and tree nuts	All commodities	All crops	Livestock and livestock products	Cattle and calves	Eggs	Hogs	Poultry and eggs	Food grains	Cotton	Tobacco	Sheep and lambs	Feed crops	Wheat	Oil bearing crops	Potatoes	Corn
+31 and more	1	5	4	3	3	3	4	5	8	5	7	7	10	2	6	8	9	11	7
+21 to +30	5	2	3	3	6	3	3	1	1	1	2	4	1	4	1	3	2	3	3
+16 to +20	1	4	2	2	—	3	3	2	2	2	2	1	1	—	2	1	2	—	—
+11 to +15	4	1	4	3	2	1	6	4	1	3	2	3	4	9	6	2	2	1	2
+ 6 to +10	5	3	5	7	5	7	3	3	3	6	3	2	—	4	2	2	4	—	—
from 0 to ± 5	14	13	11	11	11	11	9	9	9	9	8	8	7	7	7	6	5	3	3
- 6 to -10	1	2	2	—	1	2	2	6	4	5	3	1	6	1	3	3	2	2	3
-11 to -15	1	—	—	2	2	1	—	—	2	—	2	—	2	1	3	2	3	3	1
-16 to -20	1	1	1	1	1	1	1	1	1	1	—	1	—	2	1	1	2	3	3
-21 to -30	2	2	3	1	2	2	3	2	1	2	2	2	2	3	2	2	2	3	2
-31 and less	—	2	—	2	2	1	1	1	3	1	4	6	2	1	2	4	2	4	4
Average deviation (in percent)	11.0	15.4	14.2	14.0	14.8	13.3	15.2	15.7	19.1	14.7	19.7	23.1	21.6	15.1	18.7	23.7	26.1	35.5	27.5

unstable performance of the non-agricultural sector of the economy, that is, the more violent swings caused by certain business cycles and by wars.

At this point we shall pull together the threads and indicate briefly in closing the frame of reference and the working hypotheses that appear to us to have promise in analyzing the instability of farm income over time.

1. Lessening the instability of farm income has become a basic policy objective in the United States. This objective has significance and merit on social, political and economic grounds.
2. To achieve this desired stability in farm income the government should not undertake programs that make agricultural production unstable.¹⁶ Production control is not an appropriate means for counteracting the adverse income effects of business depressions and of wars and the aftermath of wars on agriculture.
3. Nor should farm prices be maintained at a particular level in the market place in order to stabilize farm income over time. Price maintenance programs of this type are not appropriate means for counteracting wide swings in aggregate demand caused by unstable conditions in the non-agricultural sectors of the economy.
4. Income stabilizing programs are too heavy a burden for the pricing system to bear if it is to function efficiently in guiding agricultural production and in channeling farm products to consumers.
5. To lessen the instability of farm income and to do it in ways that will not burden the pricing system, it will be necessary to find ways and means for transferring income to farmers during periods when aggregate demand becomes depressed.
6. These income transfers should meet the following conditions: (1) they should be strictly countercyclical in design, (2) they should not induce production decisions in agriculture inconsistent with long run requirements, and (3) they should not clog the channels of trade.

¹⁶ Production adjustments, however, are required on efficiency grounds, and these adjustments call for certain public policies and action. Measures to aid under-employed persons in agriculture to transfer to other occupations, to lessen capital rationing and to reduce soil losses are of this type.

TECHNOLOGICAL ADVANCE AND THE STRUCTURE OF AMERICAN AGRICULTURE

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AMERICAN agriculture has grown in two main ways. The first was primarily settlement—the expansion of farmers into new areas of a wild continent. The second is technological advance—the creation of more fruitful ways of making the means of life.

The settlement form of growth was by far the more important until the close of the nineteenth century. From 1880 to 1900 American agriculture turned out a 25-percent larger volume of production through technological advance as reflected in production per worker. But it brought forth a 34-percent output expansion through the settlement of some 303 million new acres (including 116 million crop acres) on the part of 2.3 million new farm workers.¹ Except for the Plains and the West, settlement virtually ceased to be a form of agricultural growth after 1900, especially after 1920. Yet, in terms of food and fibre output for human use, agriculture grew faster than ever, expanding about 50 percent in the last quarter century.

As a mode of agricultural growth, then, the settlement era is practically dead. Yet it is very much alive in terms of the prevailing structure of our national farm plant and our traditional aims of life. For our present pattern of farms which was born of the settlement era, as well as many ideals and values that were first wrought out and stabilized in our national character by the older disciplines of that period, are now being gnawed at by the very technological advances through which farm people today are so greatly increasing their productive power and removing the drudgery of their toil. The three-century conquest of the wild expanse from the Atlantic to the Pacific outwardly took the form, for the most part, of owner-operated family farms within reach of any pair of willing hands. The backfire of this method of conquest into the imagination of the people became the ideal and ambition for an ever-expanding

* While each has exercised a critical check on the other's work, the senior author is mainly responsible for the technical information and the junior author is chiefly responsible for the formulation of the argument and writing.

¹ John M. Brewster, "Farm Technological Advance and Total Population Growth." This JOURNAL, Aug. 1945, pp. 513-519.

agriculture of self-bossed workmen—masterless men in the truest sense of the word.

But with this conquest now well over, contemporary agriculture grows almost entirely through technological advance that day by day whittles down the number of farms, seals off the doors of farm employment opportunities, and makes it harder and harder for self-bossed farmers as a group to keep their footing on the soil. It is little wonder, therefore, that farm people are even more concerned with the technology of the scientist and engineer than with the business cycle of the economist. For the prospective downswing of exchange values that forebodes ill times ahead is largely counterbalanced by faith in a remoter upswing, whereas the pressure of technological advance upon the older organization of agriculture is unrelenting.

Accordingly, in line with this mingled concern of farm people over the impact of new mechanisms on both the fruitfulness of their hands and the heritage of their past, this paper (so far as available information permits) seeks light on the rates of farm technological advance in the Nation and various regions since 1900 and the effect of such change on the number and proportion of units in significant groups of farms, with special emphasis on the outlook for family farms.

I

Although farm technological advance may be measured by the changing productivity of any given resource, its reflection in output per worker is most suitable for the task at hand. For it is in these terms that such advance is reshaping the number of persons needed in agriculture and the number and proportion of farms in significant size groups. It is also mainly in these terms that the compatibility of family farming as well as owner-operatorship with technological advance must be appraised.

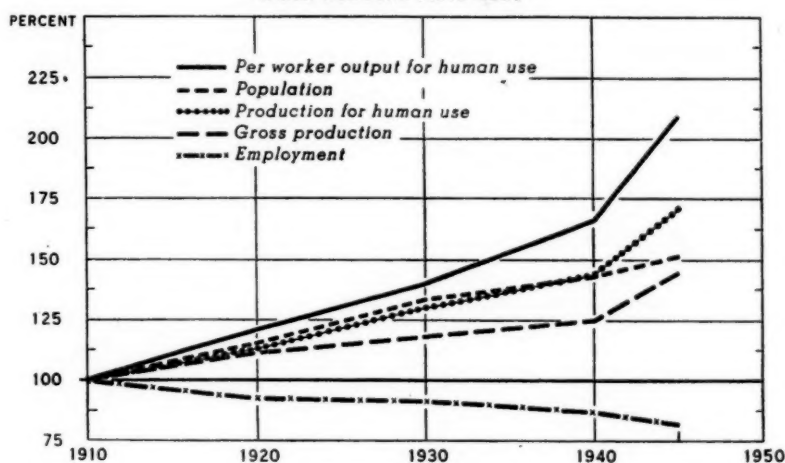
In the process of shifting farm power from animal to mechanical energy, technology increases farm worker output for human use at a faster rate than his gross or total output.² Besides increasing

² For the years 1919–1945, productivity data used in this paper are the two series prepared by Glen T. Barton and Martin R. Cooper, *Farm Production in War and Peace*. The first series is there called *Gross Farm Production*, and the second *Farm Output*. "Farm Output" is that portion of gross farm production which is available for human use while "Gross Farm Production" includes all farm production for both human use and for the production and maintenance of farm workstock. Since

total output per worker, this shift from animals to machines further increases the food and fibre output that is available for human use by reducing the amount of farm output required for workstock. For example, farm technological advance (as reflected in total production per worker) and total population growth proceeded at about the same rate from 1910 until 1940 (approximately one percent per year). After 1920, when the tractor began crowding out the

FARM EMPLOYMENT, GROSS FARM PRODUCTION, FARM PRODUCTION FOR HUMAN USE, PER FARM WORKER OUTPUT FOR HUMAN USE, AND TOTAL POPULATION, UNITED STATES, 1910-45

INDEX NUMBERS (1910=100)



SOURCE: SEE TABLE I

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(FIGURE I)

horse, this advance, as reflected in per worker output for human use, began outracing total population growth. From 1930 to 1940 such advance became more than 2.5 times faster than population growth.³ But more important now and for the years ahead is the

there are thus two measures of farm production, there are likewise two measures of farm worker productivity. Both measures are essential to an understanding of farm technology.

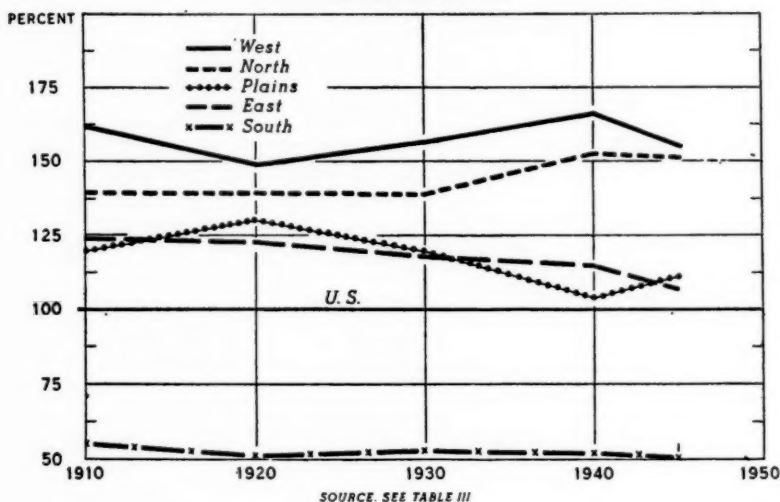
Each of the Barton-Cooper series was extended by the authors back to 1910 through the use of Strauss and Bean's "Gross Farm Income and Indices in the United States, 1869 to 1937"—See Footnote 3, Table I for further details.

³ This disparity of rates is considerably greater if the Census farm labor force series is used instead of the BAE series. The BAE series is used in this paper because

fact that since 1940 technological advance has exceeded population growth in terms of per worker output for human use as well as gross output.

In other words, the outracing of population growth by output for human use per farm worker has almost ceased to be the result of a temporary shift in the form of farm power and has become the function of more permanent characteristics of scientific agriculture,

COMPARATIVE LEVELS OF PER FARM WORKER OUTPUT FOR
HUMAN USE, UNITED STATES AND REGIONS, 1910-45
INDEX NUMBERS (U. S. = 100)



(FIGURE II)

such as better plants and animals, disease and pest control, wider use of fertilizer, soil care, and so on. From 1920 to 1930, the substitution of machine for animal power was responsible for one-half of the increase of farm output for human use, one-third during the next decade, and only one-tenth from 1940 to 1945. In 1920

it permits, whereas the Census series does not permit, regional measures of farm technological advance. On the other hand, the Census series does permit a measure of such advance on a national basis over a much longer period of time. See footnote 1, "Farm Technological Advance and Total Population Growth."

horses and mules used up 21 percent of total farm production, but only 7 percent by 1945. Should this rate continue, the conversion of farm production for workstock to food and fibre for human use would be substantially completed about 1955.

In short, although the substitution of mechanical power is still of some importance in increasing per worker output for human use, the outracing of population growth by farm technological advance as reflected in such output now comes chiefly from other sources.

TABLE I. FARM EMPLOYMENT, GROSS FARM PRODUCTION AND PRODUCTION FOR HUMAN USE, PRODUCTIVITY PER FARM WORKER, AND TOTAL POPULATION, FOR THE UNITED STATES, 1910 TO 1945
(1910 = 100 for all indexes)

Year ¹	Farm employment ²	Agricultural production ³				Productivity per worker		Total population ⁵	
		Gross	For human use ⁴			Gross	For human use		
	Number Index	Million dollars Index	Million dollars Index			Index	Index	Number Index	
1910	12,132 100	7,805 100	6,072 100			100	100	91,972 100	
1920	11,293 93	8,679 111	6,860 113			120	121	105,711 115	
1930	11,207 92	9,171 118	7,871 130			127	140	122,775 133	
1940	10,562 87	9,752 125	8,748 144			144	166	131,669 143	
1945	9,964 82	11,230 144	10,396 171			174	209	139,223 151	

¹ Employment and production entries are three year averages centered on year indicated. Production data for 1945 are preliminary.

² BAE series, annual average farm employment.

³ Data for years 1919 to 1945 obtained from Glen T. Barton and Martin R. Cooper, *Farm Production in War and Peace*, U. S. Department of Agriculture, Bureau of Agricultural Economics, Washington, D. C., December 1945, Table 2, p. 12 and Table 18, p. 74; preliminary data for 1946 from the same authors. Estimate for 1909 to 1911 derived from Frederick Strauss and Louis H. Bean, *Gross Farm Income and Indices of Farm Production and Prices in the United States, 1869 to 1937*, U. S. Department of Agriculture, Washington, D. C., December 1940, Table 61, p. 126, Ideal Index. Values expressed in 1935-39 dollars.

⁴ That portion of gross production available for human use.

⁵ U. S. Census of Population. Estimate for 1945 from Series P. 47, No. 1.

There is, therefore, no tangible reason why agriculture should not continue for the visible future as an expanding industry in terms of food and fibre output but a contracting industry in terms of the number of farms and farm workers required to feed and clothe the Nation.

Certain differences may now be noted in the comparative levels and rates of farm technological advance in the broad economic

regions.⁴ The West started out with the highest output per worker in 1910 and has consistently kept in first place, but the North (in second place) is now a strong competitor. While production per worker has increased substantially in the East, the rate of advance has been less than the national average. In 1910 the output per Eastern farm worker was 24 percent above that of the average, whereas in 1945 it was only 7 percent greater. The Plains are somewhat erratic but consistently above the U. S. average.

The South started out in the lowest position in 1910 and has fallen slightly further behind since then. It is the only region where farm worker productivity is less than the national average. The output of one Northern or Western worker is roughly equivalent to that of three Southern workers.

TABLE II. NUMBER OF TRACTORS PER 1,000 FARM WORKERS
UNITED STATES AND REGIONS, 1920 TO 1945

Year	U. S. Number	East Number	North Number	South Number	Plains Number	West Number
1920	22	17	37	4	37	40
1925	44	59	82	11	57	61
1930	82	105	152	16	123	107
1940	148	171	290	26	231	169
1945	245	301	460	61	353	265

Source: U. S. Census of Agriculture, and BAE series on annual average farm employment.

In mechanization, the South is about where the non-South was in 1925. By 1945 the rest of the country had 370 tractors per 1,000 farm workers as compared with 68 in 1925. The South had only 61 by 1945. Furthermore, the rest of the country is still mechanizing at a faster rate, adding 135 tractors per 1,000 farm workers from 1940 to 1945, while the South added only 35.

⁴ The regions used in this paper are as follows:

West: The 11 Western states

Plains: The tier of 6 states from North Dakota to Texas

North: Minnesota, Iowa, Missouri, Wisconsin, Illinois, Michigan, Indiana, and Ohio

East: Maryland, Delaware, and the 9 North Atlantic states

South: The remaining 12 states

These regions require a minimum change from the Census divisions and the type-of-farming regions for which farm employment is reported by the BAE. They appear to be the smallest number of regions that include all of the states and yet segregate the country into not only symmetrical but also relatively homogeneous areas with respect to historical change, such as the close of settlement period, average acres per farm, etc.

TABLE III. FARM EMPLOYMENT, GROSS FARM PRODUCTION, FARM PRODUCTION FOR HUMAN USE, AND PER FARM WORKER OUTPUT FOR HUMAN USE, UNITED STATES AND REGIONS, 1910 TO 1945

Item and year ¹	U. S.	East	North	South	Plains	West
	000	000	000	000	000	000
A. Farm employment ²						
1910	12,132	1,288	2,959	5,182	1,965	739
1920	11,293	1,076	2,709	4,741	1,846	922
1930	11,207	1,002	2,572	4,623	1,986	1,024
1940	10,562	979	2,446	4,383	1,761	993
1945	9,964	944	2,312	4,042	1,654	1,011
B. Gross production ³	Million dollars	Million dollars	Million dollars	Million dollars	Million dollars	Million dollars
1910	7,805	1,023	2,681	1,852	1,515	734
1920	8,679	1,005	2,898	1,947	1,823	1,004
1930	9,171	962	2,932	2,094	1,936	1,243
1940	9,752	1,036	3,392	2,236	1,662	1,442
1945	11,230	1,109	3,786	2,506	2,152	1,697
C. Production for human use						
1910	6,072	800	2,055	1,437	1,180	600
1920	6,860	801	2,290	1,477	1,457	835
1930	7,871	832	2,508	1,720	1,675	1,129
1940	8,748	934	3,070	1,883	1,516	1,363
1945	10,396	1,052	3,638	2,168	1,931	1,630
D. Output per farm worker for human use						
1. Index: 1910 = 100 for each series						
1910	100	100	100	100	100	100
1920	121	120	122	113	131	112
1930	140	134	140	134	140	136
1940	166	154	181	155	143	169
1945	209	179	227	194	194	199
2. Index: U.S. = 100 for each period						
1910	100	124	139	55	120	162
1920	100	123	139	51	130	149
1930	100	118	139	53	120	157
1940	100	115	152	52	104	166
1945	100	107	151	51	112	155

¹ Three year averages centered on year indicated. Region totals do not add to U. S. because of rounding.

² Derived from BAE series on annual average farm employment.

³ Derived from *Farm Production in War and Peace* and *Gross Farm Income and Indices of Farm Production and Prices in the United States*, *ibid.* Production measured by 1935-39 average dollars. Data for 1945 are preliminary.

There are some grounds, however, for anticipating substantial improvement of the relative position of Southern agriculture. For

while the non-South is still adding tractors at a faster rate, the South has started to catch up. From 1920 to 1930 the rate of mechanization, as measured by the use of tractors in the non-South was 12 times faster than in the South, 4.7 times faster from 1930 to 1940, but only 4 times faster from 1940 to 1945. Furthermore, the end of substitution of machine for animal power is in sight in the other regions, while this shift is only now getting well under way in the South. In the North there is a tractor for every two workers, but only 1 for every 16 in the South.

There is, consequently, good reason to suppose that in the next few years the South may gain on the rest of the country so far as mechanization is concerned. This will vastly change the structure of Southern agriculture, relieve farm workers of much of their present drudgery, and greatly increase their productive power. But whether it will enable them to reach a technological parity with the rest of the country is a question. For, among other reasons, the fact that non-Southern regions are now so far ahead of the South in the substitution of machines for animal power may enable them to concentrate on other forms of technological advance sufficiently to keep their present advantage, at least for many years.

II

Attention may now be directed to the impact of the comparative rates of technological advance upon the number and proportion of units in significant groups of farms. For this purpose, the tracts whose resources are so small as to produce less than \$400 total value of output (at 1939 prices) are disregarded as a part of the national farm plant and are therefore taken out of the total number of Census farms and farm production. This is done because such tracts are not farms in any farmer's sense of the word although they do meet the Census definition of a farm.⁵ Most of them have no power at all or only one horse or mule, harvest less than 10 acres of cropland and their "operators" are either unable to work or are usually engaged in off-farm work for a livelihood.⁶ And they average

⁵ This definition is currently as follows: "A Farm, for Census purposes, is all the land on which some agricultural operations are performed . . ." and of not " . . . less than 3 acres . . ." or " . . . its agricultural products . . ." are " . . . valued at \$250 or more." See section on "Definitions and Explanations" in any current state or national report by the U. S. Census of Agriculture.

⁶ For other characteristics of these tracts, see *Farm Characteristics by Value of Products*, Technical Monograph, coop. study, U. S. Dept. of Agr. and U. S. Dept. of Commerce, Wash., D. C., 1943.

less than \$200 total output, mostly for home use. In short, these units are neither capable of feeding a family even at subsistence levels from home-grown stuff nor meeting more than a negligible

TABLE IV. NOMINAL FARMS: NUMBER, AVERAGE VALUE OF PRODUCTS, AVERAGE LAND PER FARM, AND PROPORTION OF CENSUS TOTALS, UNITED STATES AND REGIONS, 1900 TO 1945

Item and year	U. S.	East	North	South	Plains	West
	000	000	000	000	000	000
A. Number ¹						
1900	1,889	194	410	990	218	77
1930	2,005	131	341	1,095	307	131
1940	2,095	172	416	1,037	305	164
1945	1,966	226	400	934	248	158
B. Average value of products ²	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
1900	220	229	227	223	201	168
1930	209	213	199	221	199	179
1940	202	177	181	220	201	169
1945	191	167	175	206	201	176
C. Average acres ³	Acres	Acres	Acres	Acres	Acres	Acres
1900	73	47	54	56	184	138
1940	72	52	58	48	126	177
D. Percent of total						
1. Number of farms						
1900	32.9	26.5	22.7	47.1	25.6	31.7
1930	31.9	24.4	21.0	44.3	26.6	26.0
1940	34.4	32.2	24.9	44.0	29.9	32.2
1945	33.6	41.2	25.1	40.9	26.4	32.0
2. Value of products						
1900	7.4	5.5	4.4	17.2	4.4	3.0
1930	5.8	3.4	3.1	15.7	3.9	2.1
1940	5.4	3.4	2.8	13.3	4.6	2.3
1945	4.3	4.1	2.5	10.3	3.0	1.8
3. Land in farms						
1900	16.4	12.6	10.4	26.8	15.7	11.3
1940	14.2	17.1	11.1	26.0	11.1	11.3

Source: Derived from U. S. Census of Agriculture.

¹ Farms reporting less than \$400 value of products, not fed to livestock in 1900, and sold, traded or used by farm households 1930 to 1945. Products from green-houses and nurseries reported separately in 1930 have been included in the total.

² All values in 1939 dollars. The price indexes used were: 1899=66.7; 1929=154; 1939=100; 1944=205. (From BAE and Strauss and Bean.)

³ For 1900 estimated from U. S. Census of Agriculture, Volume V, Part I, Table 17, pp. 230; for 1940 adjusted from *Characteristics of Farms by Value of Products*, op. cit. Not available for 1930 and 1945.

fraction of essential cash costs for family living and farm operations. Since these are the absolute minimum requirements which a tract must fulfill in order to function as a farm in any farmer's use of the

term, these units are "farms" in name only and therefore may be disregarded as a part of the actual structure of American agriculture.

Since 1900 the number of these nominal farms has hovered around 2 million. While they constitute a relatively stable proportion (about one-third) of all Census farms, they account for a negligible and steadily declining proportion of total farm production and marketings.

Excluding nominal farms from the Census total, there remain for the period 1900-45 about 4 million units which for the most part meet the everyday meaning of a farm. In practical (functional) terms, these units fall into three significant groups—family farms, larger than family farms, and inadequate farms.

As stated elsewhere: "*Family farms* are all units (1) whose land and capital resources are at least (a) large enough to yield sufficient farm earnings to enable the farmer and the farm to continue indefinitely as a going concern through meeting all farm and family living expenditures but (b) *small enough* to permit labor, technological management and business (entrepreneurship) functions being performed mainly by family members (i.e. at least 50 percent of the annual labor input must be provided by the family) and (2) whose operating control arrangements actually invest the farm operating family with responsibility for running the farm. *Larger-than-family-farms* are units whose land and capital resources are so large as to involve an annual labor input at least twice as large as the family labor force. *Inadequate farms* are all units (1) whose land and capital resources are so limited that farm earnings are insufficient to enable the unit to continue indefinitely as a going concern, or (2) whose operational control arrangements are such as to divest operating farmers of managerial control over farm operations."⁷

In terms of total value of output at 1939 prices, the limited information now available indicates that for the country and farms as a whole, under 1939 conditions, the lower limit of family farms (and the upper limit of inadequate farms) was about \$1,500.⁸ The upper limit of family farms (and the lower limit of larger-than-family farms) was roughly \$10,000.^{9,10}

⁷ John M. Brewster and Howard L. Parsons, "Can Prices Allocate Resources in American Agriculture?" this JOURNAL, Nov. 1946, pp. 948-49. Footnotes on these pages give further justification of these definitions.

⁸ *The Farm Housing Problem*, U. S. Department of Agriculture, U. S. Congress, 79th Session, Senate, Special Committee on Post-War Economic Policy and Planning, Hearings on Housing, Part 12, pp. 1897-1901.

⁹ *Farm Characteristics by Value of Products*, op. cit., p. 102, table 1, and p. 135, table 6. On farms reporting \$10,000 and over value of product, hired labor outnumbers family nearly 5 to 1, but on more than two-fifths of these farms there were

TABLE V. NUMBER OF FARMS (EXCLUDING NOMINAL) AND PERCENT OF TOTAL NUMBER BY CLASSES, UNITED STATES AND REGIONS, 1900 TO 1945

Item and year	U. S.	East	North	South	Plains	West
	000	000	000	000	000	000
A. Total farms						
1900	3,848	539	1,394	1,114	635	166
1930	4,284	405	1,282	1,376	849	372
1940	4,002	362	1,256	1,321	716	346
1945	3,893	322	1,195	1,347	693	336
B. Percent of all farms						
1. Inadequate ¹						
1900	74.5	70.1	67.5	89.8	71.0	57.2
1930	69.3	56.3	60.7	89.9	63.7	49.7
1940	65.8	51.1	53.0	85.5	67.5	48.8
1945	58.8	46.3	46.3	82.0	50.5	39.3
2. Family ²						
1900	25.0	29.5	32.1	10.0	28.0	38.6
1930	29.6	42.2	38.6	9.7	35.0	46.0
1940	32.8	46.7	45.9	14.0	31.1	45.7
1945	39.2	50.9	52.3	17.4	47.3	52.1
3. Larger than family ³						
1900	0.6	0.4	0.3	0.2	0.9	4.0
1930	1.1	1.5	0.6	0.4	1.2	4.4
1940	1.4	2.2	1.1	0.5	1.4	5.5
1945	2.0	2.8	1.4	0.7	2.2	8.6

Source: Derived from U. S. Census of Agriculture. See footnotes 1 and 2, Table IV.

¹ Farms reporting value of products from \$400 to \$1,499.

² Farms reporting value of products from \$1,500 to \$9,999.

³ Farms reporting value of products of \$10,000 and over.

Because of differences in technological levels, customary standards of living, price levels and price relationships, it is recognized that the value of product limits of these social and economic groups of farms vary through time and geographic areas. Nevertheless, the limits just mentioned may serve as a basis for making a first approximation of the change in the number and proportion of units

no hired workers or only one. Only 10 percent of these farms account for over 60 percent of all hired labor in this group. All available evidence indicates a similarly skewed distribution of hired workers on the next value of product group, from \$6,000 to \$9,999. Therefore the number of larger-than-family farms in this group, as measured by number of hired workers, is roughly offset by the number of family farms in the \$10,000 and over value of product group, so that \$10,000 is the best approximation of the breaking point.

¹⁰ As indicated in the definition above, family farms cannot be described by size limits alone since they also involve managerial control over farm production processes by the operator. However, available information does not permit correction for the bearing of this factor on the number of farms within these size limits.

in these significant farm classes since 1900 in the broad economic regions of American agriculture.

In these terms two major facts stand out—(1) the growth in the number of family farms and of larger farms, and (2) a marked decline in the number of inadequate farms, so much so as to result in a diminishing total number of farms since 1930. In general, these trends are more pronounced in regions where technological advance is most rapid.

For every 100 family farms in 1900 there were 159 in 1945, increasing from fewer than 1 million to more than 1.5 million in the country as a whole. Nearly 40 percent of this increase took place during the 1940–45 war period, 7 percent in the depression thirties, and the remainder during the preceding 30 years. In the North, the East, and the Plains, the ratio of family farms to all farms increased approximately 20 percent. This increase was smaller (13 percent) in the West where technological advance has been about as great as in the North but where family units have always been a less prominent feature of the traditional pattern of agriculture. The smallest increase (7 percent) has been in the South where both the rate of technological advance has been slowest and the pattern of family units has been a less important characteristic of agriculture.

In all regions except the West and East, family units have been increasing their segment of total farm output more rapidly than larger farms. In the North, their share of agricultural production in 1945 was 14 percent larger than in 1900, while the share of larger units was only 8 percent greater. The same principle holds for the Plains and the South. In the East, family farms have consistently increased their proportion of total output less than the larger units. And in the West, the share of output by family units is slowly declining while that of larger units increased over 6 percent in the thirties and nearly 10 percent from 1940 to 1945.

While the numbers of family and larger-than-family farms are increasing, inadequate farms are rapidly decreasing. In 1900 inadequate units constituted three-fourths of all farms and accounted for over 40 percent of all agricultural production, but by 1945 they made up only 59 percent of all farms and accounted for only 22 percent of farm production. Since 1930 this group of units has decreased by almost 700,000 (from nearly 3 million to nearly 2.3 million) while family units increased by 257,000. For the past 15 years this decrease of inadequate units at a faster rate than the

gain in family units has resulted in a diminishing total number of farms. The extent of the decline in inadequate farms is roughly similar (from 18 to 24 percent) in all regions except the South.

TABLE VI. TOTAL VALUE OF PRODUCTS (EXCLUDING NOMINAL FARMS) AND PROPORTION OF PRODUCTION FROM EACH CLASS OF FARM, UNITED STATES AND REGIONS, 1900 TO 1945

Item and year	U. S.	East	North	South	Plains	West
	Million dollars	Million dollars	Million dollars	Million dollars	Million dollars	Million dollars
A. Total production						
1900	5,198	762	2,005	1,061	950	420
1930	6,822	806	2,134	1,298	1,504	1,081
1940	7,391	875	2,576	1,488	1,288	1,163
1945	8,458	875	2,734	1,676	1,643	1,528
B. Percent of production from						
1. Inadequate farms						
1900	44	41	40	68	39	18
1930	35	24	32	68	30	15
1940	29	18	23	55	31	12
1945	22	14	18	51	18	7
2. Family farms						
1900	48	54	57	28	47	48
1930	52	62	61	27	55	52
1940	53	62	66	34	50	47
1945	57	62	71	37	63	43
3. Larger than family farms						
1900	8	5	3	4	14	34
1930	13	14	7	5	14	33
1940	18	20	11	11	19	41
1945	21	23	11	12	19	50

Source: Derived from U. S. Census of Agriculture. All values in 1939 dollars. See footnotes 1 and 2, Table IV.

In the East the disappearance of inadequate units as a rule has not taken the form of a consolidation into larger farms but of abandonment of land for agricultural purposes. For 36 million acres were in inadequate units in 1900 as against 16 million in 1940, while there was no net change in the acreage of family and larger-than-family farms.¹¹ As a consequence, the East has undergone a greater decline in total number of farms than any other region.

Because of the relatively slow rate of technological change in the South, the decline of inadequate units has been slower there than elsewhere. Until 1930 there was practically no change.

¹¹ From the source indicated in Footnote 3 of Table IV.

Since then these units have been disappearing at the rate of 9,000 per year as compared with 36,000 in the rest of the country. As a consequence, the South, which had only two-fifths of all inadequate farms in 1930, had nearly half of them by 1945. Should the South approach any substantial degree of technological parity with the rest of the country, a wholesale disappearance of these inadequate units would likely result. By the rough measures used in this paper, more than 80 percent of all farms in the South fall in the inadequate class as compared with less than 50 percent in the rest of the country.

III

In terms of size and operational control of farms, the chief outcome of the settlement era was predominantly a pattern of family farms. At the turn of the century, the primary make-up of the agricultural sector of the economy was a system of "domestic" or family industries just as was the make-up of the industrial sector at a somewhat earlier date, say 1850. Within the last half of the nineteenth century, mechanization in industry practically wiped out the family production unit as a representative institution in the industrial segment of the economy. In recent years the substitution of mechanical for animal and human energy has been going on in agriculture as in industry in an earlier period. Since mechanization is mechanization, whether in farming or industry, the man who thinks on the run quite naturally concludes that farm technological advance is bound to wipe out the "domestic system" in agriculture just as it did in industry.

Plausible, however, as is this ready size-up of the matter, it rests on at least three fundamental confusions—an assumed identity (1) of the mechanical form of farm and industrial technologies at the expense of their differences, (2) of family farms with inadequate units rather than with going concerns, and (3) of farmer operational control over farm production with an owner-operatorship form of land tenure.

The force of each of these confusions arises from the simplicity of its source but disappears upon closer scrutiny of the facts at hand.

Advance in industrial technology increasingly separates the great multitude of operations involved in a finished product into different spaces so as to perform them simultaneously and continu-

ously. For this reason, such advance so increases the number of production steps that must be done at the same time that it necessarily substitutes new units of production, whose operation may require thousands of workmen under an elaborate hierarchy of bosses, for the older system of family industries. But, as a rule, farm technological advance does not multiply the number of steps that can and must be done at the same time. For the number of simultaneous operations in agriculture varies little with either the size of farm or the "state of the industrial arts." It makes little difference, for example, whether a corn-hog farm covers the whole State of Iowa or only 160 acres, or whether farming is done with oxen, flails, and sickles or with high-powered tractors and combines; the number of production steps that can be done at the same time on such farms remains substantially unchanged.¹² The same principle applies to almost all types of farming.

In short, modern industrial and farm technologies rest on a different division of labor principle. Modern industrial technology involves a spatial division of labor because it mainly locates production steps at different points in space so as to do them all at the same time. Farm technological advance, on the other hand, runs in terms of a temporal division of labor because it continues to leave production steps mainly located at different points in time, in line with the requirements of the growth cycle of plants and animals and of climatic conditions. As a consequence, the work and management requirements of a well equipped farm as nearly coincide today with the number of persons and working abilities of an ordinary family as it did in the days of Jefferson.

Through an oversight of this fundamental difference in the mechanical form of farm and industrial technology, the erroneous conclusion arises that advance in farm technology must crowd family units of production to the wall in the same way that industrial technology has done so.

A second confusion arises from an identification of the fundamental nature of family farms with inadequate units. This is a plausible assumption because both are usually occupied by families. This occupancy is then easily taken to be the differential trait

¹² Farm technological advance actually reduces the number of simultaneous operations through (1) reducing the number of enterprises in a given farming area, and (2) transferring such processing and other operations as lend themselves to the factory system from agriculture to industry. See footnote 1, *Farm Technological Advance and Total Population Growth*, p. 524.

of family farms. Through this definition by easy imagery the conclusion is inescapable that family farms are on the way out. For this concept includes many units that are so inadequate in working resources as to be incapable of making a go of it from farm earnings alone. These units are obviously incompatible with modern technology which is ever raising the minimum land and capital requirements further beyond their reach. They hang on far past their time, either through depletion of soil fertility and capital resources, or because their operators have tightened their belts below acceptable levels of living, or have access to outside income, such as off-farm work, pensions or retirement savings. But even so, these units are disappearing each year by the thousands.

Having thus mistakenly identified family farms with inadequate units instead of with going concerns, it then follows that "family" farms will soon cease to be a representative institution of American agriculture, especially so when this identification is further reenforced by a confusion of the mechanical form of industrial and farm technology and also a confusion of operator control over farm production processes with an owner-operatorship form of land tenure. On the basis of these mistaken premises, the only logical conclusion that may be taken toward the future of family farms is that they are but a lingering vestige of the settlement era that is being forced to the wall by modern technological advance.

But this mode of thought collapses as soon as the essential traits of family farms are viewed in the light of the farming process and its units as enduring affairs. For in these terms the essence of family farms ceases to be the occupancy of pieces of ground by families and becomes such blocks of farm real estate and equipment, under family operator control, as are at least productive enough to sustain both the farm and the family from farm earnings alone.

In this light, the impact of technology upon the traditional structure of our agriculture differs radically from what is otherwise assumed to be the case. Instead of wiping out a system of family farms, such advance raises the minimum level of capital and land requirements per farm unit. For this reason, farm technological advance indeed requires the disappearance of an increasing number of inadequate units, but it does not require any displacement of the historical pattern of family farms as such. Instead of closing the door to the growth of our traditional system of family farms, technology has simply shifted the source of such growth from the

wilderness of the settlement era to the inadequate units of our contemporary agriculture. In this way the passing of the frontier transformed the source of family farm expansion from a struggle of man with nature in the raw into a competition of farm operators for each other's resources. Today's dynamics definitely favor the family and larger-than-family units. On many counts the older impersonal struggle against nature may be preferred to the modern competitive struggle of farmer against farmer, but this is no ground for concluding that farm technological advance requires any disappearance of the system of family farms.

This formulation of the adjustment drift of the social and economic units of American agriculture appears to be borne out not only by information previously submitted on change in the number and proportion of units in significant groups of farms but also by the ratio of hired to "unpaid" family labor. If farm technological advance were incompatible with the growth of family farms, this ratio would increase in agriculture as it has in industry. But this is not the case. For the country as a whole from 1925 to 1945 the proportion of hired labor fell from 25.5 to 21.7 percent. Moreover, during the same period in the North, where family units are most dominant and their growth most pronounced, and where technological advance (as reflected in per worker output for human use) has been the fastest, the proportion fell from 27.4 to 16.1 percent. To a lesser degree the same principle applies to the Plains. In the West and the East, where larger-than-family units have been growing somewhat faster than family units, the proportion of hired labor has remained about constant. This is presumably because the increased number of hired workers on larger-than-family farms has been offset by a corresponding decrease in hired workers on family and inadequate units.

Finally, the idea of a necessary displacement of family farms by larger units arises from the confusion of an owner-operatorship form of land tenure with primary operator control over farm production processes.

As previously indicated, family units of production, whether in industry or agriculture, are characterized by managerial control over their operation by the families who also supply most of the labor requirements. Historically, the vehicle of such control has been an owner-operatorship form of land tenure so that to this day the ready image of an "independent" operator is an owner-work-

TABLE VII. FARM EMPLOYMENT: ANNUAL AVERAGE NUMBER OF TOTAL, FAMILY AND HIRED WORKERS, AND HIRED AS A PERCENT OF ALL WORKERS, UNITED STATES AND REGIONS, 1925 TO 1945

Item and year	U. S.	East	North	South	Plains	West
	000	000	000	000	000	000
A. Total workers						
1925	11,447	1,057	2,711	4,723	1,969	987
1930	11,207	1,002	2,572	4,623	1,986	1,024
1935	11,010	977	2,521	4,699	1,823	990
1940	10,562	979	2,446	4,383	1,761	993
1945	9,964	944	2,312	4,042	1,654	1,011
B. Family workers						
1925	8,524	698	1,968	3,785	1,501	572
1930	8,364	685	1,898	3,672	1,515	594
1935	8,565	666	1,980	3,820	1,468	631
1940	7,998	644	1,928	3,475	1,359	592
1945	7,800	638	1,939	3,312	1,311	600
C. Hired workers						
1925	2,923	359	743	938	468	415
1930	2,843	317	674	951	471	430
1935	2,445	311	541	879	355	359
1940	2,564	335	518	908	402	401
1945	2,164	306	374	730	343	411
D. Hired as percent of total						
1925	25.5	34.0	27.4	19.9	23.8	42.0
1930	25.4	31.6	26.2	20.6	23.7	42.0
1935	22.2	31.8	21.4	18.7	19.5	36.3
1940	24.3	34.3	21.2	20.7	22.8	40.4
1945	21.7	32.5	16.1	18.1	20.7	40.7

Source: Derived from BAE series, three year averages centered on year indicated.

man. Accordingly it is natural to assume that managerial control over farm processes is so interlocked with this form of land tenure that any decline or upturn in owner operated farms is necessarily a decline or upturn in family farms.

It may be observed, however, that this association, whatever its historical grounds, is not a necessary relationship and that it is now dissolving.

There are, for example, instances of full owner operators ceasing to be family farmers because they have so bargained away their control over farm operations that they have become virtually hired laborers. Such instances are found most frequently in cases of extremely perishable crops, where "timing" is of the essence and where alternative market outlets are not available. But more important is the fact that an increasing number of operators are

ceasing to be owners, without at the same time losing control over their farm production processes. While landlords have the legal right to set forth detailed operating controls as a part of the lease, the fact remains that ordinarily they do not exercise this right so that the tenant often remains as free to run the farm in line with his best judgment as if he were an owner. Again, landlords often require certain general operating practices (such as a minimum proportion of the land in cash crops), but, in many cases, these conditions are the same as the tenant would impose upon himself if he were an owner. Under this circumstance, instead of being a form of external control over the operator's judgment by an outsider, such leases are simply a formal expression of the way in which both the tenant and the landlord would operate the farm if each were the only interested party.

To be sure, there are cases in which operator control is often over-run by bossy landlords. The question arises, however, whether such interference is not most frequently generated by inadequate units, which are unable to provide incentives and an acceptable living for their operating families and also meet normal landlord costs and expectations. Under this pressure, the landlord feels impelled to take advantage of his ownership prerogatives by interfering with the managerial discretion of the tenant, while the tenant feels impelled to improve his livelihood through exploitative farm practices. To the extent that this condition prevails, the way toward a more widespread degree of operator independence would seem to lie in some method of converting inadequate units into going concern family farms under either a tenancy or operator-ownership form of land tenure.

IV

This discussion of change in the social and economic units in American agriculture, under the impact of technological advance, is necessarily but a first approximation. Available information does not permit a more exact and extensive treatment. If, however, the approach of this analysis is reasonably correct, it suggests certain lines of research as a basis for a more intelligent grasp and guidance of changes in the pattern of our agriculture.

First, as a preliminary, research should lead to a more adequate description of the upper limit of nominal farms (the lower limit of inadequate farms) so that nominal farms may be more effectively

eliminated from farm statistics. While these tracts should be disregarded as a part of the national farm plant because their contribution to total farm output or to family livelihood is negligible, it does not follow that the people associated with these tracts should likewise be "forgotten." In fact, much information is needed as to their problems, incomes, and levels of living. The surest way to "forget" them is to continue to consider their tracts as farms, because no farm program can reach these folks and at the same time no other agencies have any responsibility for their interest as long as they go under the heading of "farmers." Further, research might show that the so-called poverty group in our agriculture is not, by and large, the people on these nominal units but the operators of inadequate farms without substantial supplementary income.

Second, having cleared farm statistics of nominal farms, research should proceed with the determination of (1) the lower limits of family farms, considered as going concerns in terms of farm earnings, and (2) the upper limit of such farms in terms of farm labor requirements.¹³ These limits will give the significant size groups of the social and economic units that make up the structure of American agriculture. The chief requirement of this line of research lies in making due allowance for regional variations of these limits with respect to major types of farming, tenure, technological change, price levels, price relationships, and accepted living levels, while at the same time maintaining sufficient uniformity of method to permit national summaries.

The third line of research requires a breakdown of farm family total income into its farm and off-farm components. This is especially important, not only as a means of measuring the lower limit of family farms, but also as a method of determining the extent to which the total income of families on inadequate units from all sources is enough for at least some savings after meeting living expenditures. Otherwise, no reliable information is at hand on the extent to which this great bulk of American farm families exist under impoverishing conditions at any given time.

¹³ Adequate determination and description of these limits will require more detailed information on nonfarm income, farm and family living expenditures, and farm labor requirements than is available from Census schedules. But, once these limits are established, forthcoming tabulations of the Master Sample from the 1945 Census of Agriculture will provide a point of departure for estimating the number and characteristics of farms by these social and economic classes of farms. From available Census schedules it is possible to extend such an analysis back to 1925.

The formulation of more realistic agricultural policies and programs is dependent upon improvement in at least two fundamental types of information that are now grossly inadequate. One is the total number of actual farms, because only such units can be reached by farm programs. This number of farms will also provide a sounder base for informing the public at large on the size and changing nature of American agriculture. Second, since farm problems (such as prices, incomes, soil conservation, housing, etc.) vary with the fundamentally different social and economic classes of units in our farm plant, more effective farm policies and programs further requires a much more adequate analysis and description of family farms, larger-than-family farms, and inadequate units than is now available. Making those social and economic groups of farms the focus of investigation will integrate otherwise unrelated bits of information into better tools for guiding change in our agriculture along constructive paths.

MIDDLEMEN'S ACCUMULATIONS AND EXPECTATIONS IN MARKETING FARM PRODUCTS

H. S. IRWIN*

Production and Marketing Administration

THE purpose of this paper is to invite attention to the importance of the accumulations of middlemen in the modern marketing of farm products.¹ Such accumulations are substantial, having largely replaced the part played by consumers, and to a less degree that played by producers, in carrying farm products forward until they are required by consumers. The accumulations are governed mainly by the expectations of middlemen as to the amounts which consumers will pay for the products accumulated and the quantities which consumers will require during the remainder of the season.

By middlemen's accumulations of farm products is meant the amounts of each commodity (including products and by-products) purchased by middlemen following harvest or during periods of seasonally heavy production in excess of immediate merchandising or processing needs. An example of such stocks is the quantities of butter withdrawn from consumption during the period of flush production and placed under refrigeration. Ordinarily the accumulations are built up to seasonal peaks during the periods of heavy farm marketings and then are drawn down to zero or to low levels by the end of the respective seasons. Frequently there is no definite separation between the accumulations of a commodity and the administrative stocks required in its processing or merchandising, but the administrative stocks are characterized by much smaller fluctuations in volume.

The marketing problems posed by middlemen's accumulations of farm products are complicated to a considerable extent by the tendency toward concentration. Commonly a large proportion of the accumulation of each commodity is held by a comparatively small number of concerns, usually at the wholesale level, and indications are that frequently the amount is so burdensome as to require relief. Such problems are peculiar to large-scale accumu-

* The opinions expressed are the authors only and do not necessarily represent the official views of the U. S. Department of Agriculture.

¹ Accumulations of other products are important as well but because of differences of organization in production and marketing it is convenient to restrict the present discussion to middlemen's accumulations in the marketing of farm products.

lations, but are very real to the middlemen involved. The advantages of the concentration, however, appear to have overbalanced the difficulties.

Analysis of the accumulations reveals that the following elements of marketing are involved in them:

1. Influencing market prices, especially during accumulation
2. Making a market when farm offerings are large
3. Equalizing the flow of commodities to consumers
4. Regulating, in part, the seasonal pattern of consumption
5. Storing the stocks accumulated
6. Financing the accumulation
7. Assuming the risks of ownership (principally price changes).

Although these accumulations and the expectations which govern them are important in the modern marketing of farm products, they are not considered explicitly in current marketing literature. It is true that marketing texts and other material include discussions of storage, financing, and risk assumption, but these separate and general discussions fall far short of presenting the full picture of the part played by middlemen's accumulations which must include the first group of elements noted above.

Failure to give explicit consideration to the importance of middlemen's accumulations leaves a wide gap in the understanding of the marketing of farm products. The omission results in a material under-estimation of the services rendered by middlemen, especially in the wholesale field, and is at the root of warped impressions concerning some other elements of marketing.

These conclusions are supported by the following exploratory survey of the part played by middlemen's accumulations and expectations. The main points are : (1) accumulations of farm products by middlemen have increased greatly, matching the reduced proportions carried forward by consumers and producers, (2) the accumulations tend to be concentrated in a comparatively small number of concerns, principally at the wholesale level, (3) the concentration tends strongly to become burdensome, and (4) in the principal commodities the concentration is relieved either by means of organized or unorganized trading in futures or by the formation of vertically integrated corporations. In view of the importance of these accumulations they, and the expectations which govern them, should be studied with an eye to increased social efficiency in their operations.

Middlemen's Accumulations of Farm Products Are Important

In the absence of quantitative data a convenient indication of the importance of the accumulations of farm products by middlemen is the extent to which middlemen have replaced consumers and producers in carrying forward these commodities from their production to their ultimate consumption. A hundred years ago most farm products were carried forward by consumers.² Nearly every family of standing had wheat or flour to last until the following harvest, fruits and vegetables were dried, and meats were dried, salted, or smoked. Today, many families buy bread from bakeries or stores each day or two, depend upon canners or quick-freezers for fruit, and rely upon meat packers and butchers for meat.³

To a smaller degree, the role of farmers in carrying forward their products likewise has decreased. A materially larger proportion of farm products is marketed promptly than was the case 100 years ago. Farmers also are much less self-sufficient with respect to food than they were, buying a considerable proportion currently.

Even within the past 25 years the part played by middlemen's accumulations of farm products has increased decidedly. One indication is the increase in the per capita consumption of commercially canned fruit in the United States from less than 10 pounds in the early 1920's to about 18 pounds in 1940. The corresponding increase in canned vegetables was from approximately 15 pounds per person to nearly 25 pounds. In the case of wheat the part played both by consumers and producers in carrying stocks forward has decreased since the early 1920's. The dependence of consumers upon bakeries has increased to a material degree, and from the farmer's end an increased proportion of the wheat now is trucked directly from the combine to market.⁴

Further, in some commodities, such as eggs, nearly all the quantities carried forward are owned by middlemen. Practically none were carried forward formerly by producers because of the need for specialized techniques in their preservation. In these commodities the merchants and processors have not merely taken

² Cf. H. B. Killough and Bannington Associates, *The Economics of Marketing*; 107-108 (1932). See also J. H. Frederick, *Agricultural Markets*: 1 (1939). It is recognized that 100 years ago a large proportion of families included producers as well as consumers of farm products.

³ Cf. Margaret G. Reid, *Consumers and the Market*: 74 (1932).

⁴ It is recognized that a considerable amount of wheat and other grains is handled by farmers' cooperative associations, but it is believed that at least most of them should be counted as middlemen for this purpose.

over a function formerly exercised by producers or consumers; they have added a new function in the marketing of these commodities. In certain other commodities, such as butter which in early days was salted heavily and carried forward by farmers, the part now played by merchants in carrying surpluses forward is greater than a mere replacement of the farmers' role because the present storage product enjoys a much wider market than did the heavily salted butter carried forward before cold storage. The farm products carried forward almost exclusively by middlemen by means of special techniques add materially to the proportion of all farm products carried forward by merchants and processors.

Consumers are increasingly dependent upon middlemen and farmers for the maintenance of a steady flow, particularly of foodstuffs. Putting it another way, farmers and middlemen are, in effect, partners in supplying the needs of consumers for farm products and the increased assumption of the reservoir function by middlemen has increased their position in the partnership to a material degree.

Middlemen's accumulations consist principally of seasonal and after-harvest surpluses of farm products, some of them substantial carryovers. In most commodities little attention has been given until recent years to carrying supplies forward from the season in which they were produced. "The fundamental problem in agricultural markets is to move the whole crop, or annual supply of particular products, into consumption without loss to the producers, without a shortage developing, and without much surplus or carryover into the next crop year. . . ."⁵ The accumulations of most farm products by middlemen are built up to peaks following heavy farm marketings and subsequently are drawn down to low levels or to zero by the end of the crop year.

Accumulations Are Governed Mainly by Business Considerations

Contrary to popular notions, the reservoirs of farm products built up by middlemen appear to be influenced principally by the business positions of the concerns involved. Commonly the amounts accumulated by many concerns are much larger than those which the concerns would desire solely in the hope of an advance in prices, as witness the extent of hedging in those commodities in which hedging is available.

⁵ J. H. Frederick, *Agricultural Markets*: 1 (1937).

The business considerations which result in increased accumulations take a variety of forms, all intended to improve the business positions of the respective concerns. A common form is the desire to retain suppliers and customers as well as to obtain new ones. During the period of heavy farm marketings of a given commodity, a concern which accumulates stocks will desire to purchase all the offerings of its regular suppliers lest they develop other outlets and, if practicable, to increase its volume by accepting offers from other suppliers. During the period of seasonal scarcity a concern desires to control a stock adequate to provide its regular customers with their full requirements and also to be able to offer supplies as inducements to potential new customers.

Another form is the desire on the part of processors to assure an adequate supply of seasonally scarce commodities or of certain qualities of a given commodity. For example, a flour mill located in an area of high protein wheat and specializing in flour of high gluten content may find it desirable to accumulate a relatively large supply of high protein wheat following harvest lest such wheat should be difficult to obtain later in the season.

It is recognized that middlemen's accumulations are speculative in the sense that they are subject to the uncertainties of future price behavior. Thus they may result in unusual profits or in severe losses. Certainly the accumulations and the prices at which they are acquired are influenced by the expectations of seasonal price advances in most years, even though it is generally recognized that any year may vary widely from the usual and may even be negative. Doubtless, also, there are some middlemen whose principal motive in accumulating a supply is to obtain a profit from the hoped-for advance in prices but it appears that as a commodity market becomes relatively mature the business considerations increase in importance and become the dominant factor governing the accumulations. It appears also that the competition of the concerns which accumulate stocks for business reasons tends to reduce seasonal spreads and render speculation relatively unprofitable.⁶

⁶ Such a shift in the Chicago butter and egg trade was evident in the 1930s. Toward the end of the decade numerous complaints were voiced that a "perfect hedge" (a price for November butter or October eggs which would equal the purchase price and carrying charges) was increasingly difficult to obtain and there was grumbling to the effect that the storage margin had been reduced unduly. Cf. Alonzo E. Taylor, "How Wheat Is Commonly Carried by the Trade" in *Variations in Wheat Prices*, Wheat Studies V: 271-274, June, 1929. Food Research Institute, Stanford University, California.

Concentration of Accumulations Adds to Marketing Problems

If the stocks of farm products accumulated by middlemen were evenly divided among all the middlemen involved, the problems of accumulations in the marketing of farm products would be comparatively simple. Actually it appears that the accumulations of each commodity tend strongly to be concentrated in a comparatively small number of concerns, principally at the wholesale level, with some tendency also toward concentration in certain marketing functions. Full explanation of the underlying reasons for these tendencies must wait upon further investigation but some of the factors may be noted.

The situation with respect to concentration and the wholesale level is thus described in a leading publication:

... Most producers sell their products long before the next crop year. Local merchants ... resell soon after purchasing the crops. And since manufacturers and most retailers and customers prefer to buy in quantities which conform closely to their current needs, it is the wholesale middleman who bears the major burden in carrying the investment in farm crops from the time they are sold by the producers and local buyers until they are finally taken off the market by manufacturers and final consumers.⁷

In a number of instances, however, substantial stocks are accumulated by manufacturers, as in the case of some millers.

The tendency toward concentration of the accumulations is evident within the wholesale field also because many wholesalers take little or no part in accumulating farm products. Thus the accumulations are concentrated in the hands of only part of the wholesale dealers in the respective commodities. In partial explanation of the non-participation of many wholesale dealers in this service two factors may be noted. First is the sharp difference between accumulation and current wholesale operations; second is the apparent disadvantage of small wholesalers operating in large commodity markets. Both point to the importance of adequate financial resources in the accumulation of farm products.

With respect to the difference between accumulations and current wholesale operations it is apparent that the latter ordinarily are characterized by dealings in large lots at small costs and profits per unit. In contrast to current operations the profits or losses per unit on accumulations may be large. Consequently, a

⁷ Fred E. Clark and L. H. D. Weld, *Marketing Farm Products*: 305 (1932). See also comments on reduction in stocks held by retailers in Margaret C. Reid, *Consumers and the Market*: 74, 2nd edition, 1939.

concern with limited capital may well avoid any substantial accumulation of stocks for fear that a decline in price might cripple it or even force it out of business.

Turning to the disadvantages of a small wholesaler in a large commodity market, it appears that they may cause many such concerns to expand current operations rather than attempt accumulation of the commodity handled. A small concern may enjoy local advantages, but in a nationwide market it is likely to be handicapped in dealing with distant customers who frequently require a wide range of quality of product, and the small concern may also experience greater difficulty in controlling credits, collections, and transportation questions than a larger concern. It is also more difficult for a small concern to keep its name before customers. On the whole it may be concluded that these factors may influence a number of small wholesale concerns to expand current operations, rather than to undertake accumulation of the commodity handled.

Further, the capital required in the accumulation of farm products competes sharply with that engaged in the current handling of those products. That required in current operations commonly reaches its peak during the period of heavy farm marketings which is also the time when accumulations are undertaken. A concern having only sufficient capital for the peak of current operations is not in a position to accumulate stocks.

Other factors as well doubtless operate to restrict the principal accumulations of farm products to a comparatively small number of concerns. Study of these factors will throw new light upon the activities of wholesale dealers in farm products and the services which they render. Most of the accumulations of farm products by middlemen are held by a small proportion of the concerns dealing in the various commodities.⁸

Financial resources frequently are a limiting factor in the accumulation of farm products by wholesale middlemen, particularly in commodities in which the risks of price declines cannot be shifted largely to others by means of hedging. Prudent management suggests that the ratio of commitments resulting from accumula-

⁸ This tendency is evident in the commodities placed under the Commodity Exchange Act from a comparison of the stocks owned by the larger hedgers with the total commercial stocks of each commodity. It is recognized, however, that probably the concentration in those commodities has been increased materially by the ability of the hedgers to transfer risks of price changes to others.

tions to assets should not be permitted to become high lest losses should necessitate a reduced scale of operations or even force the concern out of business. Concerns in strong financial positions are able to set up reserves in years of profits to offset the losses sustained in bad years; some concerns with limited capital accumulate relatively large stocks from time to time, and in unfavorable years a number of them are crippled or forced out of business. In commodities having organized futures markets it is possible to reduce the risks of accumulations to a large extent, by means of hedging with the result that the ratio of accumulations to financial resources may be larger in such commodities than would be prudent in commodities in which hedging is not possible.

There is reason to believe that frequently concentration of middlemen's accumulations is burdensome to many of the dealers involved. Very likely this is attributable (in large part) to the merchandising and processing considerations which induce dealers to accumulate larger stocks than they would if they were influenced only by the hope of an advance in price. Presumably the necessity of keeping down the ratio of accumulations to financial resources is especially burdensome to relatively new concerns which, growing rapidly, are eager to increase their volume of business. That such dealers are disturbed is evidenced by their efforts to devise methods to deal with the concentration.

Methods to Reduce Concentration Were Essential⁹

Incomplete evidence indicates that burdensome concentration of middlemen's accumulations characterized each of the principal farm products in turn as the market for that commodity widened and increased in size and complexity. Crippling losses and bankruptcies were common among the unfortunate or less shrewd of the middlemen who were entering upon the new venture of accumulation of respective commodities. In a number of commodities the concentration was relieved in part by the use of forward or time contracts which, in some instances, ripened into organized trading

⁹ This conclusion is supported with respect to grain, cotton, butter, and eggs by studies reported in an unpublished paper by the writer, entitled, *Organized Trading in Butter and Egg Futures: Its Background and Evolution*. The analysis indicated clearly that middlemen in the respective commodities were attempting to escape from the degree of speculation which new conditions were thrusting upon them. With respect to other commodities the generalization is largely inferential, but the inferences seem warranted by the efforts made to avoid the concentration of speculative risks resulting from the increasing accumulations by middlemen.

in commodity futures with the continued growth of the commodity markets. In certain other commodities the concentration has been relieved by the combination of a number of marketing functions into one corporation which is known as vertical integration.

Time contracts were employed extensively in grain marketing at Chicago and in cotton marketing in New York as early as the 1850's. They had been employed in the purchase of hogs in the vicinity of Cincinnati before 1850. In grain at Chicago the first instances found resulted from the tremendous increase in the accumulations of corn by corn dealers along the Illinois and Michigan Canal and the Illinois River which followed the opening of that canal. Much ear corn was hauled to dealers' cribs in the winter when the roads were not bottomless at least, but for fear of damage in shipment much of it had to be held until the late spring or summer before shelling and shipment. Evidently the resources of the dealers were strained to the utmost in providing additional facilities and in holding the rapidly increasing amounts of corn. Time contracts provided one means of relief from the concentration of accumulations. Such contracts also came to be employed in wheat, in part because the wheat which accumulated there after the close of lake navigation in the fall had to be held until the spring.

Time contracts in cotton marketing at New York attracted attention as early as 1851.¹⁰ Their use in butter and egg marketing began much later than in wheat and cotton since the accumulation of butter and eggs had to wait upon the development of cold storage. In a number of other commodities such contracts are employed at present.

It is evident that through entering into a contract to sell a specified quantity at an agreed price on a future date a dealer who has stocks on hand is able to reduce his price risks. Thus he can enlarge his operations beyond the point where prudence otherwise would call a halt. Indications are that the use of time contracts is helpful in comparatively small commodity markets at stages when they are restricted to a small number of dealers who fulfill their contracts.

Time contracts, however, became outmoded in a number of the principal commodities by the continued expansion of the market. As the number of merchants operating in the market increased,

¹⁰ Stanley Dumbell, "The Origin of Cotton Futures," *Economic History*, I: 259, May, 1927.

and as time contracts came to be used by a larger proportion of them, the difficulty of fulfillment of contracts increased, particularly at times of sharp changes in price level. Various efforts toward enforcement of such contracts were made, including provision for deposits of margins by one or both parties to the contracts with proposals that margins should be increased if the market should continue to go against one of the parties. These efforts met with only moderate success and the time contracts proved unequal to the demands of the widening markets. The need for more effective enforcement resulted in the inauguration of the early stages of organized trading in futures. Thus the early announcements of the Chicago Mercantile Exchange emphasized their contention that contracts entered into under its rules would be enforced.

Considerable evolution is evident in the organized trading in futures since its inception in each of the principal commodities. Such evolution reflected the continued growth of the respective commodity markets in size and complexity. The outstanding change in organized trading has been the development of hedging. In contrast to time contracts which contemplated the fulfillment of the contract by the delivery of the commodity specified, hedging contemplates that most futures or contracts will be settled by offset and that the commodity hedged will be merchandised in most instances by the hedger. Thus an efficient merchandiser may hedge to transfer to others most of the risks of price changes while retaining the control of the merchandising of the commodity. The development of hedging permits a material increase in the concentration of commercial speculation in the commodities hedged. At the same time it favors increased competition in carrying stocks forward because it reduces the importance of large financial resources in this function and thus allows efficient merchandisers to compete more vigorously.¹¹

Vertical integration also relieves the concentration of middlemen's accumulations although in a different way. It commonly combines functions featured by a high degree of accumulations with other functions having smaller accumulations and, in effect,

¹¹ The attempted explanation of the advantages of hedging on the basis of "transfer of risks to specialists" which are contained in a number of texts on marketing and economics are shown to be invalid by the studies of the Commodity Exchange Administration. On the whole, the other side of the hedges is taken by numerous small traders drawn from a wide variety of occupations. Indications are that their market judgment is inferior to that of the hedgers.

spreads the risks of the accumulations proportionately over all the functions included in the corporation. Tobacco is conspicuous among the farm products marketed principally through vertically integrated concerns; livestock products, cheese, and canned milk are prominent among the other products.

Obviously, the relief afforded from burdensome concentration of accumulations by vertical integration depends upon the extent to which low concentration functions are combined with those featured by a high degree of concentration. In cigarettes nearly all the marketing functions are performed by the vertically integrated concerns, from the purchase of the tobacco from the farmers at auctions to the sale of cartons of cigarettes to retailers through wholesalers whose activities are supervised. In livestock products the marketing services rendered by the leading meat packers extend from the purchase of animals at stockyards or even at country concentration points to the sale and delivery of meat to retailers.

Relief from the concentration of accumulations does not appear to have been a prime factor in the rise of vertical integration in marketing farm products. Other considerations frequently seem to have been more important; in fact, in some instances its aid in handling the concentrated accumulations may not have been recognized until after the integrated concerns were in operation. Yet the advantages of vertical integration in handling accumulations are substantial, and they contribute materially to the success of the vertically integrated concerns.

One or the other of the ways of dealing with the concentration of middlemen's accumulations—organized or unorganized futures trading or vertical integration—features the marketing of nearly all farm products. Both are found in some commodity markets. For example, in canned fruits and vegetables forward (futures) contracts are employed by independent canners while other portions of the canning field are occupied by vertically integrated concerns. In lard and provisions which are produced by vertically integrated concerns there was organized trading on a limited scale up to World War II. There is some reason to believe, however, that successful vertical integration tends to displace organized trading in commodity futures.¹²

¹² With respect to lard and provisions there are indications that the trading had been much more active in former times. Before 1880 it appears that such trading

The foregoing material indicates that the disadvantages experienced by middlemen in the evolution of their accumulations were substantial, especially during the periods of rapid expansion of the respective commodity markets. Yet the accumulations continued to increase in the face of the difficulties. This circumstance indicates that even greater disadvantages were confronting producers and consumers in the changing conditions, causing them to relinquish gradually a portion of the farm products which they carried forward.¹³ From the farmers' standpoint the difficulty of keeping in touch with consumers' requirements as the market widened may have been a contributing factor; from the consumers' viewpoint the rising standard of living and the lack of storage space in many city dwellings may be mentioned.

Social Responsibilities of Accumulations Should Be Recognized

The extent of middlemen's accumulations of farm products, the services which they render in the marketing of farm products, and the degree to which both farmers and consumers are dependent upon these services indicate clearly that these accumulations entail great social responsibilities. Popular recognition of these little understood responsibilities is highly desirable, both to stimulate constructive measures and to control abuses.

These responsibilities have been perceived only vaguely by the public and by a number of middlemen for a number of reasons. Two of the main reasons may be the failure to appreciate fully the growth of the accumulations and the difficulty of distinguishing between their collective and their individual aspects.

The present position occupied by middlemen's accumulation is may have been used to a considerable extent by a number of pork packers to hedge the accumulation of their products. Testimony to the effect that some such hedging was done in New York was given at a legislative hearing, *Report of the Committee to Investigate the Cornering of Grain and Other Articles*, New York Senate Document V: 493, No. 45, 1853. Very likely considerably more hedging was done in Chicago which was closer to most pork packing plants.

¹³ One disadvantage from the farmers' viewpoint is the effect of the financial resources of the middlemen accumulating stocks upon the prices received by farmers when marketings are unusually heavy, as in the case of a large crop. Such resources would tend to limit the amounts which could be accumulated during larger than average marketings and would tend to depress prices since after merchants had accumulated their normal amounts they would be less interested in more, unless at price concessions.

Likewise, after a season of speculative losses the desire of the accumulators to recoup their losses, in addition to the reduced funds available to them, would tend toward lowering the prices paid to farmers during the next period of heavy farm marketings.

the result of a gradual evolution. It is extremely doubtful if society would have voted in advance to entrust so much responsibility to the middlemen of the respective industries. But over a period of years the continued willingness of middlemen to purchase and hold stocks of the various commodities induced farmers and, particularly, consumers to reduce their holdings. The change in any year may have been hardly perceptible; over 25 years it is significant.

The evolution, however, applies only to the collective aspect of the accumulations of farm products by middlemen. From the individual aspect there has been comparatively little change in many features of the operation since its beginning. Each concern attempts to buy as cheaply as possible when farm marketings are heavy and to obtain the best prices possible when selling. If an accumulator pays too much for his stocks or acquires too large a stock, he must accept a loss at the end of the season. Warehousing, financing, and risk assumption remain the individual responsibility of the accumulator.

Emphasis upon these individual aspects of accumulations may be used to attempt to avoid the responsibility attaching to the collective aspects. Cloaked by comparative anonymity, many of the smaller middlemen tend to shrug off any share of social responsibility, pointing to their difficulties in obtaining profits in the face of competition. Their contentions frequently seem plausible until consideration is given to the advantages which middlemen as a whole enjoy because of the dependence of producers and consumers upon their accumulations.

Such dependence is the result of the evolution of the collective aspect of the accumulations. At the outset no significant social responsibility was apparent. When grain merchants, for example, first accumulated small supplies of wheat, the scattered holdings had no appreciable effect upon wheat marketing. Gradually, however, the continued willingness of middlemen to purchase and carry forward stocks of farm products and to feed supplies out to consumers resulted in substantial accumulations while both farmers and consumers came more and more to depend upon middlemen for these services.

Recognition of the part played by middlemen's accumulations in the marketing of farm products will contribute to increased efficiency in marketing both by improvement in performance and by correction of abuses.

Recognition would involve the development of approximate standards of performance of the reservoir function by middlemen, taking into account the problems peculiar to accumulations. It would imply commendation of an industry for unusually creditable achievements from the public standpoint as well as criticism for poor results.

Gains arising from such recognition may be predicted with especial confidence in the commodities featured by futures trading in them because recognition would correct misunderstandings which cause lowered efficiency. At present the popular prejudice against such trading, which is confused with gambling, tends to deter many men of high repute from assuming futures positions, and thus leaves the important function of price determination to men of less experience, presumably of inferior judgment, and probably with a less keen sense of responsibility. Actually it would be in the public interest to encourage the shrewdest judges of market conditions to participate in the determination of futures prices because of the importance of those prices to the producers, middlemen, and consumers of the respective commodities and recognition of middlemen's accumulations will contribute to that end.

Recognition also would aid in obtaining improved rules governing the organized trading in futures through clearing away the prejudices which now discourage the more enlightened exchange members who are attempting to render better services in the marketing of the various commodities. Popular appreciation of the way in which the trading contributes to that marketing would help materially in effecting improvements.

Turning to the control of abuses, it is apparent that the need for such controls in organized trading and in vertical integration would be thrown into sharper relief by recognition of middlemen's accumulations. This result would be pronounced in organized trading in which the popular notion that much of the trading is merely gambling, reprehensible but perhaps not too serious, has diverted attention from the results of certain practices. Actually, the distortion of futures prices by means of manipulation or other practices is much more serious than gambling and deserves stricter control.

In general the abuses found in organized trading in commodity futures result from imperfections in the rules governing the trading which, in turn, trace to lack of recognition of the functions of the trading in the minds of many of the members of the exchanges.

The two main types are (1) manipulation which includes corners and squeezes and (2) speculative price cycles.

Corners and squeezes have been known for many years but now are of reduced importance. Corners, once frequent, have nearly disappeared. The incidence of squeezes has been cut down in the commodities included in the Commodity Exchange Act, in part because of prosecutions and in part because of regulations providing for a period of delivery beyond the end of trading.

Speculative price cycles which account for a large share of the wide fluctuations in certain commodities are less well known. They were first identified in 1931 by H. Working who found 21 major speculative price cycles in a study of 43 years of wheat prices.¹⁴ In addition there were other smaller cycles, including the one in 1928 which showed an advance of nearly 45 cents per bushel from early February to its peak on April 30 and was followed by an even greater decline. Such cycles consist of an advance occasioned by over-optimistic buying and a subsequent decline. Indications are that they are of greater importance than corners and squeezes and also are more difficult to control.

Evidently the advances in speculative price cycles are largely manifestations of mass psychology. They result in large part from the overbuying of numerous small traders who are attracted by a rising market and who hope for a continued advance. Buying by professional traders also contributes to the advance and the buying enthusiasm is fanned by brokers, eager for additional business. When the wave of buying subsides, the price is higher than is warranted by existing conditions and a decline ensues. Professional traders are quick to close out their long positions when the advance slackens and some of them sell short on the subsequent decline.¹⁵ Small speculators tend to hold their long positions, hoping for a resumption of the advance, and frequently are forced out by

¹⁴ H. Working, *Cycles in Wheat Prices*, Wheat Studies VIII, November, 1931. Food Research Institute, Stanford University, California. See also, *Seasonal Tendencies in Wheat Futures Prices* by the writer. Processed, 27 pages, January, 1936. Grain Futures Administration, United States Department of Agriculture.

¹⁵ A minor abuse which contributes to speculative price cycles and other fluctuations in prices is the trading on price movements by professional traders. It consists of buying when prices are advancing and selling when prices are declining, expecting that the movement will be continued and depending upon the market agility of the trader to close out his positions quickly when the trend is halted or reversed. See "Risk Assumption in Trading on Exchanges" by the writer, *American Economic Review*, XXVII: 269, June, 1937. Cf. J. M. Keynes, *The General Theory of Employment, Interest, and Money*: 148-151 (1935).

exhaustion of margins. Frequently the heaviest losers are the small speculators who are drawn into the market on the buying side near the end of an advance.

Control of speculative price cycles would result in greater price stability in a number of commodities, but it must wait upon a better popular understanding of the nature of the cycles, their effects upon commodity prices, and the losses incurred by numerous small traders who take part in them. Indications are that only limited effects could be obtained by the imposition of governmental regulations under current conditions.

Much less information is available concerning abuses in the accumulations of farm products by vertically integrated corporations. In part this may be true because their operations in this respect have not been studied to the same extent by public agencies. It appears that the way is open to abuses, and while many concerns doubtless are relatively free from them, it is doubtful if this is true of all concerns. Indications are that most of the possible abuses fall into the field of imperfect competition which has received attention only in comparatively recent years.¹⁶

One possibility may be the exercise of price leadership which is considered by some authorities to be one of the most far-reaching methods of price fixing in American industry.¹⁷ In appropriate circumstances it is thought to work against reductions in selling prices; with equal logic it might hold down prices paid to producers during periods of heavy farm marketings.

Broad Study of Middlemen's Accumulations Should Be Undertaken

Only the general outlines of place occupied by the accumulations of middlemen in the marketing of farm products, as indicated by the admittedly incomplete information available, could be presented in the foregoing material. They point strongly to the conclusion that these accumulations and the expectations which govern them are important factors and that their omission warps the current understanding of marketing. Accordingly it is urged that a broad study of middlemen's accumulations of farm products

¹⁶ In the agricultural field see A. C. Hoffman, *Large Scale Organization in the Food Industries*, Monograph #35, Temporary National Economic Committee, 1941 and W. H. Nicholls, *Imperfect Competition Within Agricultural Industries* (1941).

¹⁷ See George T. Comer, "The Outlook for Effective Competition," *American Economic Review*, XXXVI: 156, May, 1946.

be inaugurated to obtain concrete evidence as to their importance, their usefulness, and what they may contribute to increased efficiency in marketing farm products. Likewise, the advantages and disadvantages of such accumulations should be considered carefully in order to determine whether or not it would be in the public interest to replace them with governmental accumulations.

It is reasonable to conclude that analysis of the services rendered by middlemen's accumulations in the movement of farm products from producers to consumers will add materially to the appreciation of the work of middlemen, especially at the wholesale level where the accumulations tend to be concentrated. It may well be true that analysis will disclose that the operation of reservoirs of farm products constitutes a large proportion of the work of wholesale middlemen, and that familiarity with accumulations is essential to an adequate understanding of wholesale commodity markets. Needless to say, the accumulations should be considered in any attempts to determine reasonable costs of marketing farm products.

Information developed by a study of middlemen's accumulations should be of great value to commodity markets which now are in the stage of rapid expansion, such as quick frozen fruits and vegetables and dried milk, where the problems of accumulation are acute. Analysis of the conditions which were experienced in comparable stages of other commodity markets and of the ways in which relief was obtained should aid the newer industries in arriving quickly at solutions appropriate to their respective needs.

Information concerning middlemen's accumulations of farm products and their concentration at the wholesale level also should be of immediate practical value to cooperative marketing associations which are seeking to extend their activities into the wholesale field. It should be helpful both to managers and executive bodies in charting their new courses and to the memberships in comprehending the nature of the new undertakings and what each hopes to accomplish.

With respect to organized trading in commodity futures, the analysis of middlemen's accumulations opens the way to positive as well as negative methods of improvement. Formerly the study of this trading has looked mainly to improvement through bringing undesirable practices under control; further research should strive also to ascertain how the forces of this trading may be geared most effectively to efficient marketing of the products traded.

Outside organized futures trading, there is reason to believe that systematic study of the virgin field of middlemen's accumulations will open the way to marketing economies through the disclosure of conditions readily subject to improvement. This condition may be most apparent in the commodity markets now featured by unorganized futures trading. With respect to the commodities handled by vertically integrated concerns there may be less room for gains in efficiency, but there may be good reason for directing public attention to the discharge of the reservoir function as well as to efficiency in current operations.

An even more important reason for a broad study of middlemen's accumulations of farm products is the question of public policy, both from the standpoint of public attitudes toward commodity futures and vertically integrated corporations and, in particular, from that of inadvertent replacement of middlemen's accumulations by governmental accumulations, possibly to public disadvantage. Since the present system has become fitted to current needs by a long process of evolution its advantages and disadvantages should be compared carefully with those of governmental accumulations before replacing it wholly or in large part with governmental accumulations.

Governmental accumulations are not proposed for the purpose of displacing middlemen's accumulations. The prospect is, rather, that in the absence of recognition of middlemen's accumulations and the importance of their services the governmental activities likely to affect them may be incidental to market support operations or to international agreements. Market support operations already have competed with middlemen's accumulations; the threat from international agreements is a new possibility arising from the high degree of control now exercised over farm products by most governments.

Market support operations by governmental agencies began in 1929 with the purchase of large quantities of wheat and cotton by agencies of the Federal Farm Board. Substantial amounts were held for several years while prices declined and finally were closed out at heavy losses. Presently even greater accumulations of various farm products were built up, principally as the result of non-recourse loans to farmers which permitted the borrower to deliver the commodity to a governmental agency if the price level per unit did not come to equal or exceed the amount lent. In certain other commodities, as in butter, support was afforded by the purchase and hold-

ing of the commodity. Part of the accumulations was donated to relief agencies, as in the case of much of the butter acquired in 1938, but governmental stocks of many commodities became very large and until World War II caused a sharp increase in the demand for commodities, it appeared that heavy losses upon them would be incurred.

It appears that such accumulations resulted in only a moderate degree of competition with middlemen's accumulations since the governmental accumulations consisted mainly of season-end carry-overs while middlemen's accumulations are made up principally of seasonal and after-harvest surpluses. It does not seem that the reduction in middlemen's holdings interfered significantly with their marketing services.

Resumption of price support programs is urged in various quarters in anticipation of returning surpluses of farm products, and indications are that the programs may be expanded materially. Middlemen's accumulations which must pay their way while rendering important marketing services are highly vulnerable to the competition of such programs which are operated primarily with a view to protecting, increasing, and stabilizing farm prices and which may draw upon the public treasury to meet losses. Should such competition cut down middlemen's accumulations to the extent of hampering their services, it might be necessary to decide hurriedly whether to restrict the competition or to replace the services with governmental activities. Would it not be wise to analyze the part played in marketing by middlemen's accumulations well in advance of such a contingency?

With respect to the possible effect of international agreements upon middlemen's accumulations, it should be borne in mind that in nearly all other countries the marketing of farm products is controlled to a high degree by the respective governments. Even in Canada the marketing of wheat and coarse grains is handled by a governmental agency. In the absence of knowledge of the services rendered in this country by middlemen's accumulations the preference of other countries for governmental control might induce our representatives at international conferences to commit the United States to a degree of government control which might prove unsatisfactory. Study of middlemen's accumulations of farm products would aid in explaining the situation here to other countries and would permit mature consideration of their advantages and disadvantages before replacing them.

NATIONAL FOOD POLICY AND SURPLUS AGRICULTURAL PRODUCTION

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SINCE 1942 we have struggled with food shortages rather than surpluses—not because food production declined—it expanded by more than one-third over the surplus-ridden prewar period—but because domestic and foreign demand expanded even more than production. Now in the second post-war year, we are beginning to worry about surpluses again; not because we expect production in the immediate future to expand further, but because we expect domestic and foreign demand to shrink. Food demand, however, will not shrink because people at home and abroad will need less food. On the contrary, they will need more. The anticipated decline in food demand will stem from the shrinking of effective purchasing power in the food market.

Hence, the phenomenon of surplus production of food as a whole originates in demand rather than supply conditions. Discounting abnormal war needs, I believe it can be demonstrated that American agriculture, as far as food production as a whole is concerned, is not over-expanded relative to the food demand generated by a prosperous full-employment economy at home and a reasonably active world trade.²

Our problem, therefore, is not one of production adjustments only, but of consumption adjustments as well, and calls for answers to these two leading questions:

1. What can be done to sustain effective demand for food at current or higher levels, and
2. What can be done about "surpluses" that might arise in certain individual foods?

Effect of National Income on Food Demand

In pre-war years domestic consumption absorbed about 97% of total food supplies available in the United States (including im-

¹ The writer has greatly benefited from the critical comments by Dr. J. D. Black of Harvard University who read an early draft of this paper. The responsibility for the findings and views expressed is entirely the author's.

² There is, of course, ample room for increasing productive efficiency in agriculture, for producing more food with a smaller farm labor force. Similar gains in efficiency can be made in many other sectors of the economy.

ports), and only 3% were exported. During 1943-45, civilians in this country consumed 80% of all the food, but that proportion was up to about 90% in 1946. (See Table 1.) It is clear that by far the most important determinant of food demand in the United States is the purchasing power of the domestic population.

TABLE 1. DISPOSITION OF U. S. TOTAL FOOD SUPPLIES¹

Year	Percent of Total Food Disappearance:			
	Domestic Civilian Consumption	Military and Exports	Domestic Production	Net Exports (+) or Imports (-)
1935-39	97	3	94	- 3
1941	94	6	95	+ 1
1943	79	21	95	+16
1945	81	19	94	+13
1946	89	11	96	+ 7

¹ From *The National Food Situation*, Sept. 1946, USDA, BAE. Food quantities weighted by 1935-39 farm prices.

Per capita food consumption² during the war increased by 15%; without rationing, consumers would have taken even more at the prevailing prices—which were well above parity. Hence, if real national income could be maintained at war-time levels, per capita food consumption at prices near the parity level might rise to 20 percent above prewar. Such a consumption rate, together with food exports amounting to above 3% of food output (pre-war rate), would absorb our total current food production at reasonably profitable prices to farmers.

Real disposable income per person (in 1935-39 dollars) was about 50% higher in 1946 than in 1935-39. At 1946 prices this corresponds to a disposable income of 146 billion dollars. At such levels of income, and at food prices near parity, domestic consumers may be expected to demand about 18-20% more food per capita—or 30% more in the aggregate allowing for population increase—than they

² The food consumption index here employed is derived from physical per capita consumption rates weighted by 1935-39 average retail prices. Hence, a shift from cheaper to more expensive foods increases the index number without increasing the poundage or caloric content of consumption proportionately. This index reflects changes in both quantity and composition of the food consumed.

did during 1935-39.⁴ This corresponds to the order of magnitude of food production achieved during the war. (See Table 2.)

TABLE 2. DISPOSABLE INCOME, FOOD CONSUMPTION, PRICES AND PRODUCTION

Year	Disposable Income		Domestic Food Consumption		Food Prod. Index	Retail Food Price Index	Farm Price Parity Ratio 1910-14 = 100
	Total Billion Dollars	Per Capita	Index				
			Total	Per Capita			
1935-39	64	495	100	100	100	100	84
1941	89	662	110	108	115	105	93
1943	125	907	106	106	133	138	119
1945	140	994	112	112	136	139	116
1946*	146	1,029	123	115	134	160	120

* Preliminary.

Quite apart from the general level of prices and national income, the pattern of income distribution by size also affects aggregate food demand. In 1941, families with \$1500 income spent about 33% for food, while \$10,000 families only about 14%.⁵ The marginal propensity to purchase food decreases rapidly as family incomes exceed \$5,000. Hence, an increase in the income of the upper third of the families may hardly be reflected in aggregate food demand, while a similar absolute increase in the lower third would strengthen the food market substantially. If the national income were distributed first according to the depression pattern of 1935-36, and second to the prosperity pattern of 1942, and the propensities to purchase food peculiar to the various income groups remained constant, domestic consumers would in the second case demand 15-20% more food than in the first case at the same level of food prices.⁶

These considerations suggest this proposition:

Domestic consumers can be expected to absorb a 1943-46 volume of food production at or above parity prices as long as (1) disposable income does not fall materially below \$146 billion (at 1946 prices), and (2) this income is distributed according to the pattern prevailing in

⁴ Although the proportion of consumer expenditures for food was higher than normal during the war, the proportion of disposable income used for food did not change materially. Hence, the money that could not be spent for many consumer goods went into savings rather than food purchases.

⁵ See U. S. Dept. of Labor, Bul. No. 723, p. 20.

⁶ See R. Schickele, "Programs for Maintaining Food Demand," this JOURNAL, Feb. 1947, p. 326.

1945-46 or better (i.e., a larger than pre-war proportion of total income secured by the lower-income groups).

It follows, that general food surpluses are not likely to arise directly on account of reduced foreign demand (as is often argued), but rather on account of a decline in national income and a deterioration of its distribution. This holds particularly for livestock, dairy, and poultry products, most vegetables and fruits⁷ from which farmers derive about 80% of their cash receipts from food production.

The Nature of Food Surpluses

It is, of course, way beyond the scope of a national food and farm price policy to stabilize national income on a full employment level. Our problem is how to maintain an effective food demand high enough to absorb capacity food production at reasonably adequate prices *in case of declining national income and attendant distortions in its distribution*. If fiscal and other policy measures succeed in keeping the economy operating in high gear, serious general food surpluses are not likely to arise within the near future; but if such measures fail, widespread surpluses are bound to develop, and the spectre of want in the midst of plenty will again shake the foundation of our economic system.

At this point it is necessary to differentiate between various aspects of the surplus problem.

1. The term "surplus" has economic meaning only as it refers to a specific level of prices. *Theoretically*, this level is determined by marginal cost-return relationships. If *aggregate* food production is so large relative to effective consumer demand that the *general* level of farm prices drops to a point where a substantial proportion of farmers cannot meet production and living expenses (including reasonable charges for fixed land and capital assets), food production is in economic surplus. In applying this definition to *individual* foods, great difficulties are encountered on account of the joint-cost character of the farm production process and the widely varying limits of shifting resources from lower to higher priced products. The *administrative* determination of surpluses of *individual* farm products as provided in existing price support legislation is based on extremely weak theoretical foundations. There is good evidence that these "parity

⁷ Wheat, rice, peas and a few important fruits are an exception in the sense that their normal volume of production is significantly above normal domestic requirements and their prices depend to a large extent upon export demand. The threat of continued potato surpluses is primarily the result of support prices being out of line with production costs. Problems of individual food surpluses will be discussed later.

prices" are too high for some commodities (e.g. wheat, potatoes, eggs), too low for others (e.g. dairy products).⁸

2. *An over-all food surplus* (when the combined farm price parity ratio falls below say 90) resulting from a decline in national income *should not be eliminated by restrictive production controls*. The nutritional needs for national health do not vary markedly with business conditions. The families of unemployed workers require nearly as much food as when they are employed. Opportunities for shifting labor out of agriculture into industry are practically nil during depressions.—Hence, *measures to eliminate over-all food surpluses must be applied on the demand side*, by assisting consumers in absorbing the food supply at terms which permit the producers to remain solvent. Such measures may be called "*consumption adjustments*."
3. As long as some kind of a price support policy for individual farm products is in effect, *surpluses of individual foods* (when a specific food product falls below whatever support price is established) should be remedied by one or a combination of the following measures:
 - a. *Revision of the support price* if there is evidence that it is out of line with the production cost structure of the farms producing the bulk of the output; or if the established support price stimulates a volume of output clearly in excess of what consumers are willing to purchase at that price.
 - b. *Consumption adjustments*, such as direct food distribution programs through school lunches and various non-commercial outlets, supplementing the purchasing power of consumers through some food stamp program, concentrating consumer purchases upon the surplus food by "abundant food campaigns," or expanding export outlets.
 - c. *Production adjustments* by inducing a shift of resources from the surplus food to other products (farm or non-farm) with more favorable cost-price ratios. Such shifts might well require public assistance in the form of conditional loans, grants and technical guidance. The acceptance of such assistance should be voluntary on the part of farmers. If such a shift should prove impracticable, or if the surplus is considered temporary or seasonal on account of abnormally high yields, emphasis should be placed upon other than production adjustment measures.
 - d. "*Supplementary payments*" to farmers covering the difference between the free market and a reasonable support price, if the surplus is considered temporary, or if such payments can be administered so that they do not discourage desirable production adjustments.
4. We are here concerned primarily with food. Surplus problems in *non-food farm products*, like cotton, tobacco and wool, affect the food

⁸ For a recent discussion of parity prices, see the "Report of the Committee on Parity Concepts" in this JOURNAL, February 1946, pp. 380-397, and the series of papers on this subject presented at the Association's annual meeting, Dec. 27, 1945, *ibid.*, pp. 267-305.

situation only as resources are shifted out of these commodities into food production. In principle, the same criteria apply to non-food surpluses.

This brief exposition of the surplus problem recognizes the existing legal obligation of the government to support farm prices of various foods at certain levels, but assumes that considerable latitude can be obtained to modify specific support prices and methods of support operations.⁹

For purposes of policy formulation, it is most important to decide whether a given surplus condition should be remedied primarily from the demand side, or from the supply side, or through support price adjustments. This decision should rest upon the character of the respective "surpluses" and of the factors from which they arise.

Production Adjustments

Before discussing measures for relieving food surplus conditions from the demand side, let us sketch the limits within which adjustments on the supply side appear justified.

"Production adjustments" have become most fashionable words in the profession. And rightly so, since one of the major concerns of economic analysis is the process of resource allocation. I submit, however, that we are in danger of becoming lop-sided in our analytical approach if we take the pattern of demand, of "consumption allocation" for granted, and concentrate our efforts entirely on adjusting resource allocation (production) to the demand pattern of the present and recent past. There is no reason why the demand structure—which basically represents consumption allocation—should not be subject to the same scrutiny and made amenable to "adjustments" as production and resource allocation.

The concept of production adjustment necessarily refers to a given demand pattern. But if there is evidence that the current demand pattern is distorted or "maladjusted," it would be foolish to adjust production to that maladjusted demand.

We are acutely aware of this issue with respect to the demand distortions brought about by the war directly. But we seem to be much

⁹ Whenever Congress decides to review the whole structure of farm policy, a much more clear-cut distinction between the *ends* of national nutrition, farm production adjustments, farm income and price stabilization, and the *means* to implement those ends, should be achieved. See the Award Papers of the National Farm Price Policy Contest, this JOURNAL, November 1945.

less aware of the demand distortions brought about by depressions, unemployment, contracted foreign trade, and a seriously maladjusted income distribution. We are prone to adjust production to the general demand and price conditions of the inter-war period. Is it really justifiable to accept these conditions as the norm toward which to adjust resource allocation in agriculture?

Short-run and Long-run Adjustments

Individual farmers, of course, must to some extent adjust their production to short-run conditions—after all they live in the short-run. But public policy, especially in a free-enterprise economy, should leave a maximum of day-to-day decisions to the individual entrepreneur.

In agriculture, production adjustments to short-run changes in demand are severely limited by the nature of the industry. Production periods are long, the proportion of fixed factors is high in the resource total, and the annual output of an individual farm is beyond the operator's control by a wide margin. It is, therefore, important *to distinguish between production adjustments achievable by shifting variable factors and those requiring shifts in fixed factors.*

Re-allocation of Variable Resources

A farmer can make certain short-run adjustments in his production by:

- (1) shifting feeds from one to another livestock enterprise;
- (2) buying more or less feed;
- (3) changing the proportions of his land in the various crops;
- (4) changing rates of fertilizer application.

And that about completes the list. The practical limits of variation in these resource shifts are rather narrow. Changing the size of breeding herds already involves longer-run decisions. In any given year not all farmers can buy more feed as the annual total supply is fixed. Rotation and soil conservation requirements limit the change in individual crop acreages. Large sections of highly productive farming areas do not depend on fertilizer at all.

Hence, seasonal and even year-to-year adjustments in resource allocation can bring about only marginal changes in output—especially since hardly all nor even a majority of farmers will shift resources in the same direction simultaneously. This holds at least for the major food and feed products and in peace times. Such

short-run adjustments become more and more limited in scope as the degree of specialization increases, or the next best alternative use of a given resource yields a greatly reduced output value (e.g. from wheat to range grasses).

Nevertheless, temporary surpluses of several important foods can be at least partially relieved by such shifts in the allocation of variable resources; for instance an egg surplus by shifting feeds to hogs, beef or dairy cattle, or a potato surplus by shifting land to feed crops, sugar beets or other vegetables or reducing fertilizer application. Moreover, such adjustments can be appropriately induced by a combination of forward prices and production goals or by the free market price mechanism; they are definitely impeded by support prices which are out of line with costs on the one hand, and with prices of competing products on the other.

Reallocation of variable resources is not likely to result in a reduction of over-all food output. Even the far-flung AAA production control program during the thirties was not able to reduce total food production, which was fortunate, since such a reduction might have aggravated the general economic and social distress during the depression beyond the dangerpoint of revolution.

Because of the essentiality of food to sustain the life of people, and the fact that even under prosperity conditions millions of American families go hungry, *adjusting production downward to relieve a surplus by letting resources lie idle is economically and socially unjustifiable.* In such cases it is preferable to tackle the problem from the demand side or through supplementary payments.

Reallocation of Fixed Resources

Major long-run adjustments in agricultural production involve changes in the allocation of such relatively fixed resources as:

- (1) land area in cultivation, permanent pasture and timber;
- (2) size of breeding herds;
- (3) number and size of farm families;
- (4) amount and types of farm buildings and improvements.

If we were to take any current demand pattern for granted, adjustment to an over-all food surplus during a depression would require a reduction in all of these resources at least in terms of their degree of utilization. This would inevitably involve under-employment or idleness of a considerable part of the resources since their alternative employment opportunities outside agriculture would be practically nil.

From the viewpoint of economic welfare *continued production from mal-allocated resources is much better than no production from idle resources*. Hence, over-all food surpluses arising from a depression-distorted demand pattern should not be relieved from the supply side, but from the demand side by means of appropriate consumption adjustments.

The situation is different if chronic surpluses develop with respect to a reasonably adequate demand pattern under prosperity conditions. Only then is it a problem of shifting fixed resources out of agriculture and re-allocating them into other production lines. The most important resource involved in such a shift is, of course, the labor force of farm families. Here, too, mal-allocation is better than idleness. The transfer of farm labor out of agriculture should be encouraged only to the extent to which that labor can actually find employment elsewhere with at least the same productive value (or real income) as it yielded before. Hence, *the best time for bringing about such major shifts is in prosperity, not in depressions*.

Criteria for Production Adjustment

In view of these considerations I should like to submit several tentative propositions whose validity deserves testing.

1. In much of American agriculture more could be produced with less labor. Such increases in productivity per worker and in living standards, however, are equally possible in much of industry and trade. Product value per worker in agriculture as a whole increased at about the same rate as in industry as a whole between 1900 and 1940. This problem, therefore, is not peculiar to agriculture.

2. Transference of full-time farm labor from agriculture to industry should not be encouraged at a rate higher than industry under full employment can absorb. To that extent, however, public policies designed to facilitate such transference (e.g., through vocational training, employment services and financial assistance) should be developed.

3. Subject to (1) and (2) above, the labor force now engaged in total food production is not seriously out of line with requirements for meeting a reasonably adequate demand pattern likely to develop under conditions of full employment, improving income distribution, growing industrialization abroad and expanding world trade.

4. If periods of major unemployment, deteriorating income dis-

tribution, and shrinking world trade should re-occur, it is wiser national policy to develop demand adjustment and consumption programs and to keep the farm plant producing—than to plan for over-all output reductions and for shifting resources out of agriculture into idleness. For national economic welfare, “mal-allocated” resources are better than idle resources. This principle applies to industry as well; but since food is the main essential good whose consumption cannot be deferred for even a couple of days, or reduced by more than a small amount without causing hunger and unrest, this principle applies with particular force to agriculture.

5. There is current need for internal production adjustments within agriculture. A national policy of forward prices and production goals could become a most valuable instrument for bringing about desirable production adjustments and a reasonable degree of farm price stability. Price support operations required to administer forward prices should not be permitted to interfere with the consumption flow. If surpluses should threaten to accumulate, market prices should be allowed to drop below support levels, and supplementary payments to farmers covering the difference between the announced forward price and the market price should be employed. Production goals should be developed so as not to result in a less than normal total food production index; the combined index of forward prices weighted by the production goals should be kept close to an appropriately defined parity index.¹⁰

6. The concept of production adjustments might well be broadened to include soil conservation requirements and cost-reducing measures. The implementation of these adjustments cannot depend upon forward prices and production goals alone. Assistance to individual farmers in the form of technical advice, small multi-purpose (“barn-yard”) loans, relocation aid, and improvement in tenure conditions are needed. Cost reduction should become an explicit objective of agricultural policy. Effective cost-reducing measures could remove much of the surplus problem in several farm products by making their production profitable at lower prices.

Wheat and Cotton Surpluses

There are only a few major farm commodities which have repeatedly appeared in “surplus” position even during periods of

¹⁰ For details, see R. Schickele, “A Price Policy for Agriculture,” this JOURNAL, Nov. 1945, pp. 878-885.

relatively full employment. In recent years prices of potatoes and eggs required support operations several times under existing legislation. Both support prices are probably too high and may have contributed to bringing forth an output larger than the market could absorb at these prices. The character of these surpluses is not rooted in the long-time structure of agriculture. There are good alternatives to potatoes and eggs in their main producing areas; support prices could be lowered and still leave their production profitable, and consumption programs could be used to expand effective demand at least for eggs. Simultaneous measures along these lines would bring demand and supply in balance without large-scale public expenditures or structural production adjustments (involving re-allocation of fixed factors).

The situation is different for *wheat*. Here, too, the support price is too high. In terms of technical production efficiency there is no reason why American wheat farmers could not successfully compete with Canadian, Australian, and Argentine producers. But tariffs, commodity loans and price support guarantees have kept wheat prices above the world market for over two decades, and much of this price advantage has been capitalized into land values. A sudden and drastic lowering of the support price for wheat would cause real hardship to many producers.

And yet I question whether wheat production should be reduced to where the market would absorb the output at present support prices. Some acreage reduction is justified on conservation grounds; beyond that, however, the next production alternative in the main wheat areas is range grasses with a very much lower return per acre in nutrients and value. A substantial shift from wheat to grazing would require far-reaching structural changes in the agriculture of the wheat regions, displacing a large proportion of wheat farmers and involving wholesale consolidation of farms and high individual and social costs.

On the other hand, wheat is easily stored and transported, is a staple food for two-thirds or more of the world population, and is also an excellent feed grain. In the long-run, industrial expansion abroad is likely to lead to increasing import requirements of food and feed grains to support the growing urban population and the expanding livestock enterprises which are associated with industrial development and rising living standards.

When wheat surpluses will again arise in the United States and

other exporting nations, clearly the first line of attack should be on the demand side. Consumption programs under national and international auspices for undernourished peoples, and price arrangements which would permit certain types of wheat to be used as feed grain, could go a long way in averting accumulation of wheat surpluses.

At the same time, it would be in the interest of wheat farmers themselves if our policy were directed toward bringing domestic wheat prices in line with world prices. This might involve a systematic devaluation of land in most of the wheat areas by means of refinancing mortgages and related measures. The cost of such a program could well be assumed by the Federal Government as the saving to the American consumer would make up for the cost of land devaluation and refinancing within a few years' period. Undersized wheat farms could be consolidated in that process which would further reduce production costs. Farm families thus displaced should be assisted to relocate elsewhere in farming or outside of agriculture. Without such a corollary program the lowering of wheat prices to world levels might cause unbearable hardship to so many wheat farmers that political pressure would most likely block any change in wheat price policy.

By far the most important production adjustment problem is in the *cotton* region, especially in the old cotton South. Domestic cotton prices have been maintained above world prices much longer than wheat prices, and this price protection has also been capitalized into land values. Bringing domestic and world prices of cotton together requires similar land devaluation and refinancing measures as in the wheat regions. But here the similarity between the cotton and the wheat problems ends.

There are several reasonably close production alternatives to cotton in the Old South, such as various food and feed crops and livestock enterprises. Soil, climate and location are favorable to diversified farming in many areas, and some progress in that direction has occurred during recent decades.¹¹ But cotton acreage is still over-expanded from the viewpoint of soil conservation as well as of real production costs.

Apart from the problems of land devaluation, two powerful

¹¹ Cotton production controls under the AAA have effectively reduced cotton acreage, much of which was shifted to grasses, feed and food crops, and have contributed to diversification.

forces are blocking the road to diversification and better living standards in the old cotton South: the tenure system with its share cropping and emphasis on cotton as the paramount cash crop, and the general poverty of the masses of farm and town people. Prevailing tenure arrangements prevent or discourage share croppers and tenants from growing more food and raising livestock for home use and market. The poverty of croppers, tenants, and many small owner-operators bars them from access to credit on reasonable terms—credit desperately needed in the form of small loans for a team of mules, material for fences, livestock sheds, poultry houses, water facilities, limestone and fertilizer for crops other than cotton. The poverty of town people narrows the local market outlets for the variety of food crops and animal products (especially milk, lean meat, and eggs) which would be forthcoming under diversified farming, and in which both town and farm diets are so notoriously deficient.

Clearly cotton price policy has wide ramifications reaching far beyond price support, storage, and surplus disposal operations. Under present price supports cotton is bound to re-appear in chronic surplus. Lowering the support price for cotton necessitates as well designed set of production adjustment measures; but the whole brunt of the adjustment need by no means fall entirely on the supply side of the market. Demand adjustments should be made with respect to increasing consumption of cotton at home and abroad as well as increasing and diversifying local food consumption in the South. Simultaneous adjustment programs on the demand and supply side would supplement each other, would minimize the number of farm families to be uprooted in the production adjustment process, and would maximize the benefits of the total adjustment program to the welfare of farmers and consumers alike.

If such simultaneous adjustments in the demand and supply structure of cotton and food could be made; if lower-priced cotton consumption could be expanded in old and new uses at home and abroad; if cotton production costs could be reduced permitting higher cotton incomes from lower prices; if local food demand could be increased so that high-cost cotton farms could shift to food—then the order of magnitude of the cotton surplus and the oversupply of farm labor in the cotton south would appear considerably smaller than is now estimated, and the concrete problems of bringing about local production adjustment with all its technical,

social, and institutional ramifications would become more nearly manageable.

Maladjustments in the Demand Structure

When "free market" prices of farm products drop so low that farmers cannot meet their production and living expenses, the conclusion is usually drawn that production is over-expanded and should be reduced by shifting resources out of agriculture into other lines of production. Obviously the inference is that the supply side of the market is to be blamed, and that the demand side is above censure like divine law, or at least beyond human control like the weather.

Hence, many agricultural economists and officials turn their main attention to production adjustment programs to remedy the surplus situation, throwing the whole burden of adjustment upon the supply side of the market. During the thirties, when over-all food "surpluses" prevailed throughout most of the decade and gigantic output reduction programs were put into effect, the actual "adjustment" achieved of aggregate food supplies to the market demand was practically nil. The food production index hovered near the 100 mark throughout the period, despite two extreme drought years in close succession, and despite severely depressed farm prices.

There was, of course, considerable shift in output between farm products going on during that period, mainly from cash grains and cotton to live-stock—but no net shift of resources out of agriculture. Indeed, the total farm labor force increased as a result of clogged farm-city migration and urban unemployed seeking refuge on farms.

In the industrial field output was effectively reduced and prices were maintained well above those of farm products. But that did not spell prosperity for industry either. In terms of economic equilibrium analysis, the supply adjustment to the current demand was nearly perfect—but it was an adjustment to a shrunken and badly distorted demand.¹² It was more like reestablishing the physiological equilibrium of a cancer patient by letting the person die rather than by removing the cancerous growth.

¹² J. M. Keynes has demonstrated how a free enterprise economy could maintain equilibrium at almost any level of employment. See his *General Theory . . .*, Ch. 3 on the "Principle of Effective Demand," and Ch. 18 on the "General Theory of Employment Restated."

Although total food consumption remained at pre-depression levels, there was widespread under-consumption of food during the thirties among millions of unemployed and low-income families. The nation's food supply was so unevenly distributed that about two-thirds of the families were moderately or seriously undernourished, while the other third consumed (or at least purchased) substantially more than they needed for a liberal nutritionally adequate diet.¹³ Food waste in restaurants and in well-to-do families accounted for a substantial part of total food disappearance.

It is not difficult to imagine what would have happened if food production would have been reduced by say 20%, and food prices would have stayed on a level comparable with steel and fuel and most durable consumer goods. Many million more families would have gone hungry, demand for non-agricultural goods would have dropped still lower since food would have taken a larger share of consumers' expenditures. An economic and social upheaval would have engulfed the nation, from which farmers would not have been spared. A really effective food production control during a depression would not lead to farm prosperity, not even to a "balanced depression," but to wholesale starvation and revolution.¹⁴

A depression distorts the demand structure in the first instance, and most major supply maladjustments are derivatives of that distorted demand. Net capital formation ceases, not because of lack of savings, but because of lack of demand for investment. Unemployment rises, not because workers have so much that they need not work for a while, but because employers have no demand for them. Food prices dive faster and deeper than most other prices not because people want less food, but because they do not have the money to pay more for it. Demand and supply are not like the hen and the egg—we do know that the demand came first.

Most "production adjustments" which seem economically desirable during a depression should be under strong suspicion of representing an adjustment to a maladjusted, abnormally shrunken

¹³ In 1942, a year of nearly full employment, that proportion was reversed, with only one third of the diets failing to meet nutritional standards of adequacy. See National Research Council, *Inadequate Diets and Nutritional Deficiencies in the U. S.*, Bul. 109, Nov. 1943; and *Family Food Consumption in the U. S.*, U.S.D.A., Misc. Publ 550, p. 25.

¹⁴ To "balance out" a depression between the farm and non-farm segments of the economy, it would be much more sensible to induce maintenance of non-farm output than to reduce farm production. See M. Ezekiel, *Jobs for All*. A. Knopf, New York, 1939, for some thought-provoking ideas on how to maintain industrial output.

demand. If that suspicion can be verified, adjustment programs should be applied to the demand side, especially in the case of so essential a product as food. Food consumption cannot be "deferred" without serious sacrifices in health and morale of a population, and the margin of nutritional safety in the diets of the majority of families is precarious indeed.

What policy measures are available, within the general framework of the present socio-economic order of the United States, to bring about desirable adjustments in the demand for food?

Maintaining Effective Food Demand

There are various means for maintaining food demand in face of declining national income.

Any transference of income from higher to lower income families has the effect of strengthening the demand for food, because of the higher propensity to consume food in the lower income brackets. Increases in wage rates and social security benefits, replacement of excise and sales taxes by income taxes, and public deficit financing work in that direction. These measures tend to sustain prices for consumer goods in general (of which foods are a part), but do not aim specifically at maintaining the effective demand for food.¹⁵

General Food Consumption Adjustments

It is possible to earmark income transferances for general food expenditures and thereby assure that a major part of the public funds thus transferred is spent on food.

1. The *School Lunch Program* is of such a nature. The funds contributed by the government represent supplemental income received by the families of participating students in the form of food. Probably a substantial part of these funds represents a net addition to the nation's food expenditure. That addition is large, when the incomes of the participating families are low, and the amounts charged students for meals are small.

At present the scope of the School Lunch Program is rather restricted; for 1946-47, about 75 million dollars were appropriated out of Federal funds. Participating schools match the Federal

¹⁵ For a cogent discussion of general consumption adjustment measures designed to maintain aggregate effective demand, see J. H. G. Pierson, "The Underwriting of Aggregate Consumer Spending . . .," *American Economic Review*, March 1944, pp. 21-55.

funds from state or local contributions in cash or kind.¹⁶ A considerable part of the local contributions are recovered by prices for lunches. Moreover, part of the food now purchased by the schools would be purchased by the individuals in the absence of the school lunch service. We may not go too far astray if we assume that most of the Federal contributions, but hardly more, represents a net addition to aggregate food expenditures under present conditions, or less than two tenths of one percent of the nation's total food bill.

Potentially, however, the School Lunch Program could be expanded to strengthen total food demand significantly. If all students enrolled in public grade and high schools were offered a mid-day meal free of charge, the program would require public funds, (federal, state, and local) of around 900 million dollars at food prices prevailing in 1945.¹⁷ If 30 percent of this amount would constitute a net addition to total food purchases, it would represent an increase of about 1.2 percent over the retail value of all farm food products. Since the supply and demand elasticities of food as a whole are quite low, the bidding away of even so modest a portion of the food from the rest of the population (especially the higher-income families) would have a more than proportional effect on food-prices and at the same time improve the distribution of food with respect to nutritional needs. Apart from such a general price stimulating effect, the School Lunch Program offers the most effective disposal outlet for foods procured by the government under price support operations. In this way, the program can be used to achieve demand (and price) adjustments in the market of individual foods.

2. Establishing a *nutritional floor* below which no family would need to fall would stabilize aggregate food demand at a level higher than would otherwise prevail even under full prosperity conditions.

¹⁶ All states with a per capita income equal to or higher than the U. S. average (\$1,117 for 1946-47) must match federal funds equally; in all states below that average, the percent of matching required is the State's per capita income as a percentage of the U. S. average. See section 7 of "National School Lunch Act," Public Law 396, 79th Congress.

¹⁷ Of the total enrollment of 27 million students, 20 million could be expected to participate. Assuming 180 school days and a cost of 25¢ per meal, total cost under the program would amount to 900 million dollars. If 60 percent of this cost represents the food value of the meals, the program would entail a food expenditure of 540 million dollars. If half of this amount would be spent for the children's luncheons by their families directly in the absence of the program, the net addition in food purchases would be 270 million dollars, or 1.2 percent of the retail value of farm food products of 23 billion dollars in 1945.

This is the purpose of the National Food Allotment Program proposed by Senator Aiken in Senate Bill 1151 of the 79th Congress (re-introduced as S.131, 80th Congress). Every American family would be entitled to receive an income supplement sufficient to bring its food expenditure up to where it can buy a low-cost adequate diet. The bill provides that a family can purchase for 40 percent of its income food coupons whose face value equals the current retail cost of such a diet. The difference between the family's contribution and the cost of the diet is borne by the government. Families whose income is more than $2\frac{1}{2}$ times the cost of the "food allotment" would find no advantage in participation. Under normal conditions, the cooperating families would be free to buy with their coupons any foods they choose.

The public funds required for such a program would vary greatly according to business conditions in counter-cyclical direction. The program could be confidently expected to keep farm food prices as a whole at or above any reasonably defined "parity level," and would, therefore obviate many farm relief or price support expenditures which otherwise would have to be incurred.¹⁸

Both these programs could stand on their nutritional and general welfare merits alone. Whether food surpluses are clogging the market or not, these or similar programs could be justified purely on grounds of national health and productivity, and their cost be considered as a highly productive investment in the nation's human resources. They would place food in a similar position as elementary education; a minimum adequate amount of it would become the

¹⁸ See R. Schickele, "The National Food Allotment Program," this JOURNAL, May 1946. See also W. W. Cochrane, *High-Level Food Consumption in the United States*, U.S.D.A., Misc. Publ. No. 581, 1945. The effect of such a program on food prices would be more than proportional to the additional food expenditures by the participating families. Since the non-participating families are those in the higher income brackets, their demand elasticity with respect to price is low. As the participating families bid for more food, the others are willing to pay higher prices in an attempt to maintain their consumption rates. The result would be that not only the cooperators, but also the non-participants, would increase their food expenditures. Over-all food production would probably not be affected materially. If a 60 percent drop in farm prices during the last depression did not bring about a reduction in food output, and if it took almost a 100 percent increase in farm prices, a sequence of exceptionally good crop yields, a high stockpile of feed grains, and an intensive patriotic campaign to increase food output by one third during the war, the price effects of such consumption programs upon the over-all food supply are bound to be negligible. They can be expected, however, to stimulate output expansion in some foods (e.g. milk and meats) at the expense of other products (e.g. potatoes, wheat and beans), because of their differential effects on prices of various foods.

birthright of every citizen. Their effect on the productive, social, and mental capacity of the population would be similar to that of education and public health services.

In economic terms such programs represent adjustments on the demand side of the market with respect to activating latent demand for food on the part of people with urgent nutritional needs, and in the direction of maximizing aggregate utility derived from food consumption. They are discussed here merely as examples of policy measures designed to remedy maladjustments in the demand structure. Economic policy discussion would do well to explore the possibilities in this field more intensively and systematically.

Measures along these lines are effective weapons to fight off over-all food surpluses—or putting it another way, to stabilize farm prices as a whole at a level reasonably profitable for farmers.¹⁹ They are not directed at specific kinds of food; hence, surpluses of certain individual foods might still develop.

Consumption Adjustments for Specific Foods

In the absence of a large-scale general food consumption adjustment program it is quite possible that many different individual foods will appear in "surplus" during some periods in the next few years; and it is certain that the diets of millions of families will be acutely deficient in several specific foods for many years to come.

Hence, consumption adjustments for specific foods can serve two purposes: (1) relieving a surplus condition, and (2) improving nutrition. Should these two objectives ever come in conflict, the second should over-ride the first. I believe, however, that such a conflict need arise much less frequently than is claimed by some students. Perhaps with the exception of cornmeal and bread, most foods that may appear in surplus are found wanting on the tables of a sufficiently large number of families, or are sufficiently substitutable for other foods, to find a nutritionally desirable use if channeled to the right people and in appropriate amounts.

Direct food distribution is one way to correct consumption maladjustments. The government purchases certain foods and distributes

¹⁹ It has been estimated that if a food allotment program had been in full effect in the mid-thirties, the parity ratio would probably have stayed close to or even above 100, instead of falling down to the 60's and 70's. But wheat and potato prices would still have fallen well below parity as now determined. The demand for dairy and poultry products, meat, vegetables (except potatoes) and fruits would have been strengthened most, while that for wheat and potatoes least.

them to various groups of the population, either free of charge or at reduced cost. This represents a transference of foods from people able to pay but in little need for them, to people unable to pay but in urgent need. Substantial quantities of food have been thus distributed by the U.S. Department of Agriculture through relief agencies, school lunch programs, and various state and local institutions. The selection of these foods was, and still is largely determined by their surplus position in the market and is, therefore, closely tied to price support operations. Still, the effect of direct food distribution upon the diet of the recipients is on the whole beneficial, and from a social-economic view point much more desirable than the alternative of diverting those foods to non-food uses or waste.²⁰

There is also a need for strictly *nutritional consumption measures* for certain crucial foods and certain "vulnerable" population groups, such as milk and oranges for expectant and nursing mothers and infants, penny milk stations and low-priced public eating places in industrial centers. The selection and quantity of foods distributed under such programs should be largely independent of the relative supply position of those foods at any particular time and place. The United Kingdom during the war has developed such food programs on a large scale.

Issuance of food stamps to needy families is another means for channeling specific designated foods into consumption. In the Food Stamp Program, the blue stamps were restricted to purchases of foods on a surplus list.²¹ A provision in the Food Allotment Bill would permit the Administrator to designate a limited number of food coupons for the purchase of certain foods which are either in surplus or peculiarly deficient in the diets in certain areas or groups of participants.²² If judiciously applied, such measures could probably increase consumption of a few foods in acute surplus or

²⁰ The fact that at one time Californian children revolted against all the prunes in their school lunches, and a few boys of relief clients played baseball with the grapefruits that had been distributed to them, does not condemn the School Lunch and Direct Distribution Programs as such; it only condemns the neglect of nutritional consideration and education with which those seasonal surpluses were distributed. If these surpluses would have been spread over more families, wider areas and longer periods of time, the nutritional conflict would have been avoided.

²¹ See Gold, Hoffman and Waugh, *Economic Analysis of the Food Stamp Plan*, USDA, Special Report, 1940.

²² See S. 131, 80th Congress, 1947.

improve the nutritive composition of certain diets quite substantially.

"*Abundant food campaigns*" represent a consumer education program which, if conducted on a large scale with imaginative publicity and the cooperation of retailers, might well have a beneficial effect upon demand and price of certain foods in acute surplus position.

In contrast to general food surpluses (the remedy of which should be sought almost entirely in adjusting over-all food demand), correction of individual food surpluses should often place at least equal emphasis upon supply adjustments.

Individual food consumption programs strictly for purposes of surplus relief should be kept to a minimum and must be appraised in their effect upon price and output as well as upon nutrition. If their scope is too small to affect the price, they do not relieve the surplus; if their scope is large enough to affect the price, they may affect production in economically undesirable ways.

The principal criteria for appraising individual food consumption programs may be summarized as follows:

1. If a surplus appears to be of a *local or seasonal character*, and if the support price is not out of line with costs and other food prices, direct distribution to low-income families, schools and institutions, or food coupons earmarked for that surplus food, may represent worthwhile consumption measures. Direct distribution of government-purchased food has many administrative, social and economic drawbacks; earmarked food coupons under a Food Allotment program could probably move much larger quantities into consumption, but would also complicate the administration of the program. As long as such consumption programs have no greater effect on price than keeping it from falling below its appropriate relation with other prices, no undesirable production effects will ensue.
2. If *many foods appear in surplus simultaneously*, such individual consumption programs are not likely to do the job. General food consumption adjustments would be more appropriate.
3. If a *surplus threatens to become chronic* because the support price is too high relative to costs and prices of other foods, the support price should be lowered, and farmers should be assisted, if necessary, to lower their production costs and/or to shift to other products. *Individual food consumption programs are not appropriate means for relieving chronic surpluses of individual foods and maintaining the incomes of the respective farmers*; specific production and price adjustments are required.
4. An alternative to these specific food consumption programs would be

to let prices drop so low that the regular market absorbs the total supply, and to compensate the farmer by means of *supplementary payments* covering the difference between the market and the support prices.²³ I am inclined to believe that this alternative is in many cases economically and administratively preferable to specific food consumption programs. If this measure is applied to temporary surpluses of a few foods at a time and based upon a reasonable support price, its production effects will not be harmful, and its public cost not exorbitant, although probably higher than the simplest form of surplus purchase and disposal. The nutritional effect of supplementary payments would be inferior with respect to improving food distribution according to need. No production control conditions should be attached to supplementary payments if the surplus is temporary and the support price in line with other prices; in case of chronic surpluses, the support price should be reduced, and supplemental payments should be made subject to shifting some of the resources into other products—lest they contribute to the perpetuation of the surplus.²⁴

Agricultural surpluses may arise from maladjustments in demand, or supply, or price, or any combination of these. If prices are supported higher than necessary to yield reasonable profits to producers, the surplus condition can be relieved by reducing support prices. If surpluses arise under free market conditions, effective demand will be found wanting more often than supplies excessive, as long as millions of families fail to reach minimum adequate standards of consumption in many essentials for a decent living.

For more than a decade has American production capacity in agriculture as well as in industry has outrun effective demand. Why should we tailor our production capacity to the stunted demand patterns of the past, rather than tailor our consumption capacity to the full-blown supply patterns of the future?

²³ See T. W. Schultz, *Agriculture in an Unstable Economy*, McGraw-Hill, N. Y., 1945, pp. 220-236; and R. F. Eggert and O. H. Brownlee, "Advantages and Disadvantages of Direct Payments to Farmers," this JOURNAL, Feb., 1947, pp. 250-260.

²⁴ In case of over-all food surpluses under depression conditions, supplementary payments would probably be much inferior to general food consumption supports in almost every aspect—nutritionally, economically, socially, administratively. They would represent a food budget subsidy for the rich as well as the poor, would still leave millions of families in want of food, and would benefit the large-scale well-to-do farmers disproportionately more than the small less-highly commercialized farmers. It is quite possible that their federal cost would exceed the cost of a full-fledged program of general food consumption adjustment.

The most constructive use of supplementary payments is in the field of production adjustments and forward pricing for individual farm products.

LAND ACQUISITION PROGRAM OF THE WAR AND NAVY DEPARTMENTS, WORLD WAR II*

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THE outbreak and spread of war in Europe demanded large acreages of land within the United States for the expansion and training of the Nation's military and naval forces. Land was needed for training camps, airfields, bombing and artillery ranges, ordnance plants and depots, and many other activities of war. Until 1940 the Nation had not used extensive acreages of land for war purposes. However, within the following $2\frac{1}{2}$ years more privately owned land was purchased by the Federal Government than ever before in a comparable length of time. At the same time, much Federal land that was under the jurisdiction of agencies other than the War and Navy Departments was made available for military training.

Acquisition of extensive acreages for war uses brought with it many problems. Buying of large areas of agricultural land meant a mass movement of people out of the areas purchased. This in turn disrupted community organizations, school districts, and other local governmental units, as well as causing hardship among the families affected. When hundreds and thousands of workers flocked to new industrial areas which had been mainly rural before, it became necessary for the Federal Government to provide financial help for the construction of new roads, schools, and other public facilities. Housing projects, mostly temporary in nature, had to be erected at Federal expense to provide for the many new workers.

Wartime acquisition of land by the Government is necessarily different from normal peacetime acquisition. During war it is more hurried and is done with more positive powers. There is little time to consider alternatives. Occupants must move quickly, and this is often a hardship. Other large-scale governmental purchases of land—the program for retirement of submarginal land in the 1930's, the buying of land for reservoirs and power projects by the Tennes-

* This article is based on a comprehensive report by the writer, entitled *Acquisition and Use of Land for Military and War Production Purposes, World War II*. It is one of a series of war records studies published by the Bureau of Agricultural Economics.

see Valley Authority, the flood control programs, and the establishment of national forests or parks—at times have meant similar problems for individuals and communities. But during those acquisitions more time could be taken for negotiations with individuals, and often as in national forests it was not necessary to buy all of the private ownership tracts within the purchase area. In the war projects it was necessary to buy quickly all properties within a given area.

The efforts of both the War and Navy Departments to locate their larger projects on land of relatively low productivity did much to prevent inroads on the Nation's agricultural production. In addition, the large "outleasing" programs of the War Department returned to agricultural use much of the good farm land in the safety areas around ordnance plants and other projects. Co-use or alternate use of the large training areas in the West made it possible to conduct extensive military use of the range while at the same time permitting a maximum use of the grass for beef production.

The Nation has long engaged in the purchase of privately owned land for the creation of new public purpose projects and will continue to do so in the future. Possibly the greatest need in the near future will be the acquisition of land for reservoir sites needed for control of floods. Projects already planned will require that upwards of 30,000 farm families be forced to move.

Another continuing need is the return of potential timber land to public ownership unless measures are developed which will prevent the wasteful exploitation of forest resources under private management.

Because of the continuing need for the purchase of land for public purposes it is desirable that one of the major Federal land purchase programs—acquisition of land for military use—be reported on, so as to obtain a better understanding of the many problems associated with such large-scale governmental activity.

Real Estate Acquisition

On June 30, 1940, just before the beginning of the large expansion occasioned by World War II, the Navy Department had 499,961 acres of land and the War Department 2,116,862 acres, making a total of 2,616,823 acres within the continental United States held for national defense by the two Departments.

During the period of World War II these Departments bought about 6½ million acres from private owners and leased about 9½ million acres from individuals, municipalities, and state governments. In addition, slightly more than 33 million acres of Federally owned land that had been under the jurisdiction of other Federal agencies were made available for military use and war production purposes (table 1).

TABLE 1. SUMMARY OF OWNERSHIP STATUS OF LAND USED BY WAR AND NAVY DEPARTMENTS DURING WORLD WAR II

Item	War Department	Navy Department	Total	
			Acreage	Percentage of total
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Percent</i>
Owned as of June 30, 1940 ¹	2,116,862	499,961	2,616,823	5.0
Purchased during World War II	5,728,876 ²	1,017,080 ³	6,745,956	12.8
Other Federally owned under temporary use arrangements	28,340,132 ³	4,739,753 ⁴	33,079,885 ⁵	62.7
Leased from private individuals, State and local governments	9,685,031 ²	600,000 ⁶	10,285,031	19.5
Total	45,870,901	6,856,794	52,727,695	100.0

¹ Unpublished Inventory of Federal Real Estate by Federal Works Agency, Public Buildings Administration, as of June 30, 1940.

² From unpublished tabulations, Real Estate Branch, Corps of Engineers, War Department, as of November 30, 1946. Includes lesser interests.

³ Land Acquisition Report, July 1, 1940, to June 30, 1945, Real Estate Division, Bureau of Yards and Docks, Navy Department.

⁴ Report of the Commissioner of the General Land Office, 1945, tables 9 and 24; unpublished statements obtained from U. S. Forest Service and Soil Conservation Service.

⁵ Acreages made available by various agencies may be obtained from these agencies. The principal agencies were: Grazing Service, General Land Office, National Park Service, Bureau of Reclamation, Fish and Wildlife Service, all in the Department of the Interior; and the U. S. Forest Service and Soil Conservation Service, in the Department of Agriculture.

⁶ Estimates based on incomplete data on acreage in report "Leases as at 1 January 1945," Navy Department, Bureau of Yards and Docks, Real Estate Division.

The building of a huge Army and Navy and training and equipping them according to latest technological developments demanded large areas of land from coast to coast for training and ordnance production. Highspeed fighter planes and high-altitude bombing claimed larger areas of land for military training than the Nation had ever needed before.

Military camps and artillery ranges usually have from 25,000 to

100,000 or more acres, depending upon the type of training to be pursued. Armored divisions cannot safely conduct maneuvers and gunnery practice on less than 100,000 acres. Aerial training requires from 640 acres for precision ground bombing to many thousands of acres for more extensive training in flying and in operating fighter planes and in air-to-air gunnery practice. Ordnance plants and storage areas usually range from 5,000 to 10,000 acres to allow for a safety zone around the major installations; some ordnance and shell-loading plants and depots need larger areas, depending upon the type and scale of operations to be carried on. Airfields range from about 160 acres for auxiliary landing fields to 2,500 acres or more for the main fields at which the facilities are located and the personnel stationed. Special areas for testing rockets and atomic weapons are larger than those needed for any of the conventional types of military training.

The final location of military and ordnance sites throughout the Nation was determined by climate, availability of labor and material resources, and defense strategy. Many camps were located in the South, because year-round training could go on there and because of lower costs of construction and building maintenance. Scattering the ordnance sites throughout the Nation was partly to tap the resources and partly to avoid undue concentration which would endanger supplies in event of attack.

The War and Navy Departments had previous plans for many of the sites selected during the war, but much current planning was still needed. State agencies, such as the State Planning Boards, worked up general information to indicate the suitability of certain areas for military and industrial projects. Federal land management agencies, such as the Forest Service and agencies in the Department of the Interior, were asked to assist the War Department in selecting areas suitable for certain types of training. Suggestions for site locations came in also from such organized groups as chambers of commerce and from individuals.

The Plant Site Board in the Office of Production Management passed upon the selection of industrial sites for Government-financed plants. One of its objectives was to prevent undue concentration of industry in areas that were already highly industrialized.

The selection of one community over another with the same qualifications was due in part to pressure brought to bear by local interests. Local businessmen through their organizations attempted

to have a war industry located in their town or to have a camp established nearby because of the expected increase in pay rolls and in trade. But the landowners who were to be bought out often protested as they did not want to lose their farms and homes. Local interests were thus sometimes working at cross purposes. This point is illustrated by the comments from a county agent:

Our fine relationships between rural and urban groups have been strained considerably, since the agricultural area still feels bitter toward the civic organization for having suggested this area for a plant site. It is going to take a long time to get back the harmony that once existed.

When the tentative selection was announced there often was a public reaction which made the purchasing agency reconsider. Sometimes another of the alternative sites was chosen. However, the necessity of speed allowed little time for discussion and giving way to local pressure regarding one site would encourage occupants of other tentative sites to carry on endless discussion and negotiations, impeding the war program. Apparently neither the War nor Navy Department found it possible to change its decision in many instances. This is evidenced by the adherence to original decision on many of the sites even where there was much public protest.

Types of Interest Acquired in Land

The War Department initiated a policy of acquiring merely leasehold interest in land during the early period of the war. It leased the properties in several camp sites throughout the South. Soon the former occupants who had been forced to move suggested that the Government buy their properties outright. It seemed better to them to sell out completely and relocate elsewhere than to shift around, hoping to come back at an unknown later date. Most of the individual properties were so small, or inferior that the rentals were not large enough to reestablish the families in another locality.

It was more advantageous to the Government as well as to landowners for the Government to acquire fee ownership of the many improved properties needed. The provision that the Government restore the properties to their original condition upon termination of the lease or pay damages often would have cost more than the purchase price of the land. For this reason, leasing was later limited primarily to unimproved properties, such as forested tracts in the South and grazing land in the West. Other classes of leased

properties were the National Guard Camps, belonging to the States, and airports, belonging to municipalities. In the location of many airports, arrangements were made whereby a municipality would buy the land and the Federal Government pay all construction costs. The Federal Government often bought additional land to enlarge airports that were leased from municipalities. Under these arrangements the original airport facilities as well as the expansions were to revert to the municipality when no longer needed for the war.

Some of the land obtained under lease in the Western States was State owned. These State lands in most instances were intermingled with the Federally owned land made available. It was necessary to lease State lands because of the temporary nature of many war projects and the legal restrictions or reluctance of States to sell. In some States an attempt was made to exchange these intermingling State lands for Federal land located outside the military project. In the Eastern States most of the leased land was owned by individuals. In the South, too, the land obtained under lease was usually private land in large timber tracts, in many instances belonging to paper and lumber companies or turpentine operators.

The War and Navy Departments made a concerted effort to utilize land already Federally owned in locating camps, bombing ranges, and ordnance depots, if this land could serve the purpose as well as alternative locations. Land management bureaus and agencies of the Departments of Agriculture and Interior cooperated extensively in making Federally owned land under their jurisdiction available for military use. Special procedures made these lands available in the interests of the war while protecting civilian values in the land.

Use of lands already in Federal ownership expedited the land acquisition program and held to a minimum the disruption of local economic activity connected with wholesale evacuation of populated areas. This reduced the work of surveying individual properties, negotiating with individual owners, and the almost endless task of searching titles and closing the purchase transactions. All these costs as well as the purchase price of such land were eliminated. An additional advantage was the availability of up-to-date ownership records and usable maps of the lands involved, and the existence of roads and other facilities which expedited immediate military use. Use of existing Federally owned land held

to a minimum the heartaches, the confusion, and the bewilderment of people forced to evacuate against their wishes.

The type of interest acquired in the land and the methods of obtaining the needed acreage depended upon the ownership status and the contemplated use of the land. In many of the projects located on land a portion of which was Federally owned before the war, there were scattered private holdings that had to be bought. Such properties in national forests in the Eastern States had not been bought earlier because they were more economically suited to farming than to forestry. In the Western States, homesteaders had effectuated a scattered homestead pattern and in many instances settled on the better lands where they could get water, thus leaving the poorer lands to be held by the Government. These private holdings now had to be bought so the occupants could be moved from the area.

Needed Federally owned land under the jurisdiction of other Federal agencies was made available for war use under various arrangements—chiefly by Executive order, public land order, and letter of permission usually called “use permit.” Some sites were made available by act of Congress. Lease and suspension agreements developed as a result of legislation passed in 1942 made it possible to pay ranchers for the value of their rights in Federal land.

Kind of Land Bought

Publicly owned land transferred or leased for temporary military purposes and land leased from individuals was primarily in forest use or grazing use before the war. Land that was bought from private ownership, however, had a wider range of uses and represented land of higher use capabilities. Of the land bought from private owners about one-fourth was in cropland use, one-third in pasture and grazing use, another third in woodland and forests, and the remainder in miscellaneous use (table 2). These were the major uses; they were not necessarily the best uses nor the uses in which the land would yield the most satisfactory returns to the operator.

The kind of land acquired was determined largely by type of project to be located in the area. Ordnance plants and depots, storage areas, airfields, and enemy alien camps were usually located on open agricultural or grazing land. Military camps and proving grounds were usually located in areas having a low proportion of cropland. Because of the necessity of acquiring all the land

within the designated boundaries it was to be expected that all types of land would be found in most of the sites. The land acquired for military use represented all types of agricultural use as well as a wide range in agricultural productivity.

TABLE 2. MAJOR USE OF LAND BEFORE PURCHASE BY THE WAR AND NAVY DEPARTMENTS, WORLD WAR II PURCHASES¹

Item	War Department	Navy Department ²	U. S. total
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Cropland	1,434,229	272,510	1,706,739
Pasture and range	2,061,705	413,079	2,474,784
Woodland and forest	1,888,028	269,085	2,157,113
Swamp, waste, urban, and miscellaneous	218,496	62,406	280,902
Total ³	5,602,458	1,017,080	6,619,538
Percentage of total			
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Cropland	25.6	26.8	25.8
Pasture and range	36.8	40.6	37.4
Woodland and forest	33.7	26.5	32.6
Swamp, waste, urban, and miscellaneous	3.9	6.1	4.2
Total	100.0	100.0	100.0

¹ Classification made, in fall of 1943, cooperatively by War, Navy, and Agriculture Departments, and State agricultural colleges.

² Sites the Navy believed would become permanent installations were not classified. These totals derived by multiplying total acreage bought by the percentage arrived at in distribution of classified acreage; done separately for different parts of the country to obtain maximum accuracy.

³ As of Jan. 1, 1945. Does not include easements and other lesser interests as is done in table 1.

Ordnance plants have site location requirements that nearly always placed them on the best land in the community. They had to be located on land that could be excavated deeply and easily for the placement of heavy foundations. Deep soil had another advantage in that it would not carry explosive shocks as far as land with shallow rocky soil. Adequate main line transportation, both railroad and highway, was necessary. The plants were usually adjacent to rivers, so as to have an abundance of water. The large amount of hauling to be done demanded also that the land be reasonably level. The site had to be located in open country for safety yet close enough to population centers to insure an adequate labor supply. Construction of buildings, highways, and railroad spurs,

and plant operation are costly under the best conditions, but could be held to a minimum if sites with deep soil and level land were selected. Even in the best agricultural areas, such as Sangamon County in Illinois, the cost of land acquisition represented only about 2 percent of the total cost of the installation. This is a main reason why construction authorities gave relatively little consideration to agricultural productivity when deciding between alternative sites.

Ordnance depots, shell-loading plants, and storage areas do not need to be near abundant water supplies. Aside from this, they have the same requirements for site location as the ordnance plants.

Airfields were located on land as good as that for ordnance plants. Obviously, level land is required for runways. Most of the site as well as the adjacent land had to be open to avoid costly land clearing. A higher proportion of the land in airfields was used for crops before Government purchase than was true of ordnance and storage sites. This was because land of less variation in type and use was obtained for smaller sites, a condition even more true of auxiliary airfields than of the main airfields. Auxiliary and emergency landing fields usually require a small level area of about 160 acres, used only for landing purposes, while main airfields could use some less level land for barracks and grounds.

Prison and enemy alien camps contained a considerable proportion of cropland because it was intended that the occupants grow a part of their food.

Military camps and maneuver areas as a rule were located where there was a minimum of agricultural activity and so were on land not well adapted to crops. Exceptions are found in such instances as Camp Campbell in Kentucky and Tennessee, Camp Breckenridge in Kentucky, Camp Atterbury in Indiana, Fort Riley in Kansas, and Camp Adair in Oregon. In these camps from 50 to 70 percent of the land was used for crops.

Camp sites in the southern part of the country, from central Texas eastward, in most instances, were made up of land of which only from 10 to 20 percent was used for crops before purchase. Most of the land in the sites in these Southeastern States is covered with forest growth. Much of it is cut-over land of low productivity. In the southwestern part of the United States, from central Texas westward, the military camp sites were predominantly in grazing use before they were bought by the Government.

In nearly all instances, camps were located in areas with good transportation. Two railroads usually were required. It was considered an advantage also to have the camp within reasonable distance from sizable urban areas so that existing recreational facilities would be adequate and varied enough to meet the needs of large numbers of men.

Bombing and artillery ranges and proving grounds were located on the poorest types of land available. Of the 1,384,000 acres bought for this purpose only 7 percent was used for crops before the war. These sites in the western United States were located primarily in poorer grazing areas, and in the eastern United States they were located principally in extensive woodland areas.

Relocation of Families

On the basis of actual counts at a number of sites, it is estimated that approximately 60,000 rural families were displaced because of the wartime land purchase program. It is estimated that about 30,000 farms were brought. More families were affected in the South and East than in the Great Plains and the West. In most of the sites in the East and as far south as North Carolina, Tennessee, and Arkansas, the properties and farms were small. In some of the sites many small acreage properties were occupied by families the heads of which had work in nearby industry. Farther south, in many projects, there were more families than there were ownership units because several sharecroppers were on the same ownership tract. In the Great Plains and the West, the operating as well as the ownership units were large.

Hurried acquisition of large solid blocks of land creates a series of human problems which do not arise when single and scattered properties change ownership. Most important is the disruption of long-established economic and social activities of the many individuals which give life and meaning to the community. Thus the purchase of large areas affected all the citizens of the community. Evacuation of all occupants and their belongings had to be complete to make way for the conversion of large areas to new uses—army camps, ordnance plants, airfields, proving grounds, and other war purposes. This meant that farm tools and household goods had to be piled on wagons, trucks, and trailers, and that all livestock had to be herded out or hauled out of the area.

A varied program of assistance was needed to relocate many of

the families who were bought out. Some were able to relocate without any assistance, some wanted only information as to relocation opportunities, others needed both information and financial assistance, while the incapacitated needed help in the physical job of moving, in addition to information and financing. Since there was no compensation for disturbance it is certain that the displaced families suffered varying amounts of financial costs as well as the physical hardships and the more intangible heartaches and inconvenience that go with the process of being forced to sell one's home and to sever community ties.

The proportion of the families falling into the needy groups depended much upon the productivity of the land and other local resources. At Fort Leonard Wood in Missouri, for example, 304 families were displaced. As this is typical Ozark Mountain land, it is to be expected that the families would not have accumulated much material wealth. It was found that 45 family units, or 15 percent, were obtaining old-age assistance or aid for dependent children at the time of purchase. Another 30 percent did not have enough equity to qualify even for standard Farm Security Administration loans. Thus, 45 percent of the family units needed substantial outside aid to finance the cost of moving.¹

Fewer families were dependent upon the public for relocation assistance in the more productive areas and in the areas where the type of land use and ownership was in adjustment with the type of resource. Slowness in getting paid for the land was the chief reason families displaced from such areas had to have loans.

Work of County Agricultural Planning Committees

The county agricultural planning program that was in existence during the early war years (1939-42) and later the county war boards served as a medium for solving relocation problems. This program, sponsored by the U. S. Department of Agriculture in cooperation with the State agricultural colleges and State and County Extension Services was an effort to bring together the farmers and the several agricultural agencies in the counties to work in unison on problems affecting the use of land and the welfare of farmers in these counties. Major efforts were spent on projects

¹ Albert H. Mussman, Unpublished manuscript. *Implication of Land Use Adjustments in Connection with the Defense Program*. Bur. Agr. Econ., U. S. Dept. Agr., July 1941.

that furthered the war. Family relocation on the scale required by military land purchase was a tangible problem of planning for this group to work on. In some counties, as in Des Moines County, Iowa, it was decided that this problem would have the immediate attention of the agricultural planning committee.

The county agricultural planning committees or war boards were made up of county representatives of agricultural agencies and local farmers. Their activities on relocation problems consisted essentially of (1) dissemination of information; (2) surveying relocation needs; (3) listing of trucking, storage, rental, and related kinds of services available; (4) making lists of farms for sale; and maintaining an information office.

Work of the Farm Security Administration

In many areas the Farm Security Administration was the first to come to the assistance of families whose land was bought by the Government. FSA activities on such relocation problems started concurrently with the land purchase program in 1940, and were most extensive in the South. As many of the camps were located in poor land areas, the occupants usually included many who were in dire financial circumstances. The FSA was the only agency with an already-operating program designed to give adequate aid to this needy group. It had authority to extend loans with a minimum of security and to make grants to individuals having no security nor possibility of repaying.

Grants to low-income farm families to help defray moving costs and to provide temporary sustenance were not to exceed \$100 per family except in extreme cases, and were to be used for covering expenses incidental to moving, immediate subsistence, buying of materials for temporary shelter, and paying of rent for housing for a period not to exceed 6 months after relocation. Most of the grants were made in the three States of Georgia, Alabama, and South Carolina—3,071 grants averaging \$50.60 were made in these three States.² Up to July 1, 1942, the FSA had made relocation grants to 4,200 families and had assisted 235 to obtain farms through State relocation corporations, in addition to the other kinds of assistance given.

The efforts of the Farm Security Administration to develop a

² *Hearings Before the Select Committee Investigating National Defense Migration*, Part 32, Huntsville Hearings, May 7 and 8, 1942, 77th Cong., 2d sess., p. 12061.

comprehensive program to help relocate displaced farmers through State Defense Relocation Corporations warrants special mention. For States in which there were at least 25 low-income farm families to be relocated on farms, regional FSA administrators had authority to establish corporations that would buy or lease lands and develop them for these people. Relocation corporations were set up in 17 States and in all 339,222 acres were acquired.

The normal operations of FSA were considered inadequate for the needs of the many farm families who were being forced to leave their farms. It was thought that "relocation of displaced families on a sound basis could be achieved only through acquisition and development of tracts of land sufficiently large and well-disposed to make possible planning and development of profitable and varied forms of operation."³

One of the objectives of the relocation corporations was to hold to a minimum any secondary displacement, such as would occur if farm tenants elsewhere would be forced to move because the farms they were on were sold to families moving out of Government purchase areas. The corporations tried to buy land that could be developed into additional farms. Much of it was under nonresident or corporate ownership. As an example, the 41,845 acres of Bates County land bought from the well-known Scully Estate had 156 families living on it. Plans called for subdividing the land into 382 family-sized farms, which would have provided farms for an additional 226 families.

Annual sale of land by the State relocation corporations indicates that only a small amount of this land was sold to displaced families. There were several reasons for the comparatively small volume of sales.

1. Most of the land was undeveloped and needed special improvement before it was suitable for sale in family-sized farm units.
2. The restriction of the War Production Board on sale of building material imposed subsequent to the initiation of this relocation program prevented the construction of new buildings and the establishing of new farms as originally planned. Only a few sets of farm buildings were put up.
3. As it was FSA policy to hold to a minimum the secondary displacements, the tenants on the land bought by FSA were

³ Huntsville, Alabama, Hearings. Op. cit., p. 12060.

allowed to remain as the farm units that had buildings were not sold to new buyers.

4. Relocation activities through State defense relocation corporations were stopped by an opinion rendered by the Comptroller General of the United States on March 5, 1942. He held that these activities were not within the scope of FSA appropriations. In addition, the Appropriation Act of 1943 directed FSA to stop direct loans for land purchase under the rehabilitation program except where directly specified under separate acts, such as the Bankhead-Jones Act and the Wheeler-Case Act.
5. When these activities were halted, the corporations were in the midst of clearing titles and other work involved in the purchase of land. It took time to settle the legal difficulties that arose in connection with the commitments made by the corporations, so a large part of the land they had bought could not be resold until 1944 and 1945. Because of lack of development funds, the land without farm improvements was sold during this later period to the highest bidder, with or without subdivision.

Extent to Which Families Became Relocated

As the bulk of land purchase activities of the War and Navy Departments took place in 1941 and early 1942, most of the displaced families who had adequate resources were not faced with a dearth of farms for sale. The long lists which were on file in the county agents' offices attested to that. Insurance and mortgage companies, Federal land banks, private banks, and individuals had taken over many farms during the rapid decline in land prices in the early 1930's. Prices for farm land rose some between 1935 and 1940 but apparently not enough to induce all unwilling owners to sell. The rapid rise in land prices which started during the latter part of 1941 brought prices above investment values, and as a result credit institutions, whose policies were to liquidate as soon as they could do so without financial loss, started selling their farms. Farms held by estates were also more readily for sale after prices which could be obtained seemed more favorable.

Displaced farmers, as well as other farmers nearby, found temporary work on the huge construction jobs at the military camps and ordnance plants. Before the unemployment slack had all been

taken up, it was the policy of the Government to give jobs first to displaced families. Construction crews on the major projects often included 10 to 20 thousand workers and there were not that many displaced farmers in the respective areas. It was reported in some instances that a large proportion of the farmers in the county worked at these sites. Such work, however, was temporary and merely stayed off the final date of readjustment.

In the less productive land areas a high percentage of both owner-operators and tenants went to defense and war jobs. In these areas it was noticeable that not only displaced farmers but others were giving up farming for more profitable work at Government installations. Many county agents reported that wages at these sites were so high as to drain off all agricultural labor. These jobs alleviated the financial burden of relocation for the duration of the war.

Owner-operators who had substantial equity in their farms and wanted to continue farming were best able to buy the farms offered for sale in nearby communities. But one of their problems was the lapse of time between sale of the farms and receipt of payment from the Government. Those who wished to have in hand all the money needed to buy another farm may have passed by an opportunity to get a first-choice farm or may have been forced to pay more because the prices of land were rising. Many reports were received to the effect that as a rule farmers could not buy farms of equal value with the money received from the Government. Purchase of farms by the displaced farmers meant a heavy local demand for farms, and sent local land prices up above the general rise.

Tenants found it difficult to relocate on other farms because they usually had to move at a time of year when few farms were for rent. Then, too, the policy of not paying for disturbance and relocation costs meant that the tenants had to use their own money to pay for this unexpected cost.

In the early part of the wartime land acquisition program, an attempt was made to recognize the losses incurred by tenants because they had to move before the formal termination of the farm lease. Since there was no authorization to do so the Justice Department could not recognize payment for disturbance as a normal cost of land acquisition. Accordingly, the problem became one involving only the landlord and his tenants. An attempt was

made to have the landlord work out satisfactory arrangements with his tenant, and proof of such agreement made prerequisite to final payment for the land. The landlord was to pay the tenant the agreed sum out of the proceeds of the land sale. This arrangement did not seem practicable. The only equity recognized as belonging to a tenant was his pro rata share of the value of growing crops and cost of seedbed preparation. The limited resources of most tenants together with the difficulty of finding farms for rent forced them to get other work, at least, temporarily for one crop year if not longer.

Payment for cost of relocation would appear to be warranted for farm occupants but is most urgent for tenant families. Since the value of growing crops and seedbed preparation were the only real estate equities recognized to be in their possession, many had to move without receiving compensation of any kind. It was a real hardship. Tenants not only had the expense of moving but were unemployed until another farm was located or other work was found.

The Supreme Court ruling that the General Motors Corporation entitled to compensation for costs of moving apparently sets a precedent for the development of a policy which would give equal recognition to the costs enforced upon all property owners and tenants when their homes and land are acquired for public purposes.⁴

Community Problems

Many community problems arose as the Government bought large areas of land. Local governmental units, especially school and road districts, were dissolved or had to combine with other districts. Partially dismembered districts that were left that way had to reduce their services to the amount that could be supported by the reduced tax revenue forthcoming from the shrunk tax base. On the other hand, in areas where a great many workers moved in it became necessary to expand public service facilities.

The War and Navy Departments bought land in 782 counties. In only 37 counties was as much as 10 percent of the county's land area involved, thus indicating that relatively few counties suffered substantial losses in tax base. It was the smaller governmental units, such as townships and school districts, that suffered the

⁴ *U. S. vs. General Motors Corporation*, 323 U. S. 373; 65 S. Ct. 357; 89 L. E. D. 311 (1945).

greater loss in tax base. Up to January 1, 1945, there were 172 separate War and Navy sites that exceeded 5,000 acres in size. It is likely that the removal of a land area of 5,000 acres from the tax base would appreciably affect school and township finance. Off-setting benefits from increased pay rolls were not reflected in the tax receipts of local governmental units. Such benefits were primarily to individual merchants and as a result were reflected primarily in State revenue and Federal income taxes.

Closing of schools forced many children to attend other schools in the district or schools in adjacent districts. Township and county roads in the large training camp and ordnance plant areas usually had to be closed. The most necessary roads and State highways had to be relocated and at Government expense. Residents living on the edge of military reservations often had to travel several additional miles to reach neighbors or shopping localities on the other side of the reservation.

Road and school bonds usually are issued on the basis of entire taxing units. After Federal purchase, such indebtedness must be assumed by the remaining area in the district not bought by the Government. Outstanding indebtedness for roads and schools was one of the greatest obstacles to the consolidation of remnants of districts with those adjoining. Neither cared to assume those debts.

Electric power and telephone lines on land bought by the Government usually had to be relocated. Cemeteries that were in danger of damage by exploding shells or that were in the way of construction were relocated. Both were done at Government expense.

Federal Assistance for War Housing and Public Service Facilities

The Federal Government had to develop special housing programs to care for the thousands of workers who flocked to the Government plants and training areas. Local communities sometimes tried to give direction to the mushroom building boom by enacting zoning regulations and health ordinances.

The U. S. Department of Agriculture was interested in defense housing because many camps and ordnance plants were necessary in rural areas. It was thought that normal rural housing for the postwar period in areas with newly developed war industries could be improved if housing for war workers could be built on farms within commuting distance from the place of work, with an arrange-

ment for a farmer to buy the house on his land at the close of the war. This idea was used in connection with the ordnance plant at Radford, Virginia. Selection of housing sites was based on a survey made of surrounding counties to learn the need for improved rural houses and the willingness of the farmers to cooperate in the program. Under the plan, a farmer would lease a small plot of ground to the Government and at the end of the war he was to have first chance to buy the house on it. Seventy-one houses were built in this way in the Radford area and shortly after the war were sold to farmers.

An attempt was made to extend this type of rural housing to other defense areas. However, the tempo of the war program was too rapid to warrant such a program. It took too much time to negotiate and to make the frequent and lengthy calls demanded for each house that was to be built. Farmers seemed skeptical about the lease and legal procedures, and evidently did not feel certain of becoming the eventual owners of the houses. Such a program required much "salesmanship" to overcome human skepticism and suspicion. The Land Use Planning Committee of Des Moines County, Iowa, listed three reasons why it did not believe the plan would be accepted by the farmers in its county.

1. Very few farmers would be willing to enter into an arrangement of this kind without definite assurance as to when the house would be available for farm use, and as to the terms of the transfer of the house from the government to the private owner.
2. Housing defense workers in new houses in rural areas would increase the costs of rural schools; because of the low percentage of State aid in Iowa for schools this would be a serious matter.
3. Members of the Planning Committee were inclined to question the desirability of transient or semi-transient defense laborers as citizens of rural communities. They believe most farmers would object to having a house on their land that could be occupied by people over whom they had no control.

The most temporary type of defense and war housing was represented by the trailer camps established rather generally throughout the country. These were sometimes acquired by the Government and rented mainly to families of construction workers. Sometimes, the Government developed the trailer site and leased the space to owners of private trailers. Nonmovable temporary housing units were constructed in the vicinity of camps and ordnance plants. Some permanent and semipermanent dwellings were put up for

officials and permanent workers. In many areas new residential communities were established. A much larger proportion of the housing units constructed in rural and village areas was temporary than was true in urban areas.⁵

The Federal Government gave substantial assistance to local taxing units for schools, hospitals, and public service facilities in conjunction with the war housing program. Local communities could not have financed these facilities. It was a war need, chargeable to the war, and in most instances was definitely temporary in nature. This Federal aid was distributed on the basis of need for expanded facilities and was not related to losses in tax base because of Government land purchase. Thus, it cannot be considered as offsetting benefits to the taxing units affected by Federal purchase of land. As an example, in the Fort Leonard Wood area in Missouri on \$14,000 was given Pulaski County for school operation whereas more than \$400,000 was given for school enlargement and operation in the nearby villages of Lebanon, Rolla, Waynesville, and Richland, all within commuting distance of the Fort. A major portion of Fort Leonard Wood is located in Pulaski County.

Federal aid for war housing and public service facilities and operation of those facilities was authorized under the Lanham Act.⁶ Through June 30, 1946, under authority of this act, the Federal Works Agency had allotted \$481,216,691 for aid to taxing units for construction of facilities and for public services. Of the \$359,605,457 spent for public works, only \$8,275,474 was in the form of loans, while \$180,059,526 was for Federal construction and \$171,270,457 for Federal grants for non-Federal construction.⁷ Federal allotments for war public services was primarily in the form of assistance in paying of teachers, operating day nurseries, buying fire equipment, and hiring of additional policemen and employing personnel needed to operate recreational centers.

Most of such Federal assistance went to urban areas and particularly those along the coasts with their huge new populations working at ship building and training centers but a sizable proportion went to rural taxing units—those in the vicinity of military training areas or ordnance plants.

⁵ For a discussion of the war housing program, see printed report: *Public Housing, The Work of the Federal Public Housing Authority*, Mar. 1946.

⁶ 54 Stat. 1125, Oct. 14, 1940, as amended.

⁷ WS-2, Statistical Report, p. 2, Federal Works Agency, Bureau of Community Facilities, War Public Works and Services, June 30, 1946.

Conclusion

The multiple problems associated with the taking of land for public purposes stem from two fundamental concepts—the supreme right of the State to possession and occupancy of the land and the constitutional rights of the individual in that of his property cannot be taken without just compensation. All of the legal procedures, such as “condemnation” and “declaration of taking,” are devised to expeditiously effectuate the transfer of land from private to public purposes—protecting the rights of the Government as well as the property rights of the individual.

Relocation of families is the most difficult problem arising from large-scale governmental purchase of land. The necessary social and economic readjustments are difficult for all occupants of the area—whether it is a productive area or one that might best be depopulated and utilized in more extensive uses in public ownership. People who have spent a lifetime in an area are not inclined to accept the conclusion that they would be better off by moving to other areas having greater economic opportunities. It is not possible to compensate unwilling settlers for all the values associated with their homes and community.

The war is now over and the land acquisition program of the War and Navy Departments has been put in reverse. Up to October 20, 1946, a total of 1,270,000 acres of this land bought from private owners had been declared surplus and were being sold back to private ownership or transferred to other public purposes. This is about 20 percent of the total bought during World War II. It is being disposed of in accordance with the provisions of the Surplus Property Act of 1944. This law gives priority to former owner and former tenants to repurchase their former properties and thus does not permit a replotting of land into more satisfactory economic-sized farm units.⁸

Undoubtedly, nearly all of the productive agricultural land that was bought will be returned to private ownership when no longer needed for military and war production purposes. It is hoped, however, that those projects having land that is not well adapted to agricultural use in private ownership will be retained in public ownership and transferred to other public purposes, such as fores-

⁸ For an analysis of the provision of this law as it affects the disposal of rural real estate, see Alvin T. M. Lee, “Farms and Homes from Surplus Military Land.” *Journal of Land & Public Utility Economics*, Vol. XXI, No. 4, Nov. 1945.

try, wildlife, recreation, and other uses for which the land is best adapted. Returning the projects with poor land to private ownership under the priority provisions of the Surplus Property Act will perpetuate the maladjustments in use and ownership that existed there before these areas were purchased. By retaining in public ownership these projects with poor land and using them for necessary public purposes, it will hold to a minimum the unpleasant task of evicting families from their homes because of the public need for their land in the future. Retaining such projects in public ownership will make it possible to partially meet the future public needs for land without incurring costs of new land assembly or of reacquiring lands now in public ownership which may again be needed in the future.

Land in standby military projects need not lie idle. The War Department's agricultural leasing program is an illustration of how selected open areas may be outleased to farmers while major military use is proceeding on the rest of the area. During the war years 1944 and 1945 the War Department "outleased" 377,579 and 895,504 acres respectively to farmers in the vicinity of the military projects. In 1946 when many projects were designated as "standby" the acreage outleased reached 1,145,993 acres. Outleasing of land in military sites makes it possible to retain for a considerable time even some of the good agricultural land pending decision as to future military needs. Outleasing of portions of the projects that are to be retained indefinitely increases the economic opportunities of farmers in the local areas, reduces Governmental costs for fire and weed control, and with adequate provisions in the lease will facilitate keeping the land in good productive condition while in Government ownership. There is legislative authority also for delegating land management in military projects to such agencies as the Forest Service which are equipped and staffed to handle such work, while at the same time holding the project available for immediate military use. Thus, land in military projects can be used for forestry or other nonmilitary purpose while still being available for use or concurrently used for military training.

QUANTITATIVE RESEARCH IN AGRICULTURAL ECONOMICS:

THE INTERDEPENDENCE BETWEEN AGRICULTURE AND THE NATIONAL ECONOMY*

TRYGVE HAAVELMO

I Recent Developments

RECENT trends in quantitative research in economics have led away from the more superficial analysis of "market barometers" (for example, share prices and wholesale prices) towards those more basic economic factors that are the end results of economic activity, such as volume of output, consumption, investment, and real income in the various sectors of the economy. This change in objectives has brought with it a change in the necessary theoretical framework and statistical tools. The emphasis has shifted from mechanical investigations of the ups and downs of certain descriptive time series to the development of theoretical models intended to explain, quantitatively, the mutual interdependence among the various economic factors. The purpose of studying such interrelations is to obtain an "explanation" of the mechanism that determines the level of economic activity and thereby the general economic welfare of the various groups in the economy. This same purpose is equally appropriate and desirable for modern economic research concerning the agricultural sector of the economy.†

II The Network of Economic Relationships

This change of emphasis in economic research is only a reflection of the general trend in economic and political thinking. In a sense, the trend in economic thinking—among economists as well as among those who make public policy with regard to economic

* This will be reprinted in Cowels Commission Papers, New Series, No. 27.

† The amount of literature on economic research in agriculture is already enormous, and even more material and results are probably contained in unpublished manuscripts in the files of the Department of Agriculture and other agencies. As far as the literature is concerned, the reader is referred in particular to Professor Henry Schultz' monumental work on *The Theory and Measurement of Demand*, (Chicago, 1938) which contains not only Professor Schultz' own findings but also critical surveys of the work of others and extensive references to the pre-World-War-II literature. For a more technical exposition of some of the newer ideas advanced below, reference is made to M. A. Girshick and T. Haavelmo: "Statistical Analysis of the Demand for Food," *Econometrica* April, 1947.

affairs—has perhaps been ahead of the corresponding developments in the appropriate research tools for quantitative analysis.

Current economic ideas on the subject of agricultural economics and the welfare of the farm population run more or less in these terms: Because of the mutual economic dependence between the two sectors, one cannot reach a full, or even approximate, explanation of the economic conditions within agriculture unless one has an understanding of the functioning of the economic mechanism that governs the non-agricultural sector of the economy. High incomes in the non-agricultural sector are an essential condition for prosperity in agriculture, and high incomes of the farm population are likewise important for prosperity in the rest of the economy. High prices for agricultural products are associated with high farm incomes, but does this mean that an increase in agricultural prices will cause only a shift in real income from the non-agricultural sector to the agricultural sector? Or does it mean a change in total real income and employment of the economy? Sometimes it may be possible to reach an answer to such questions through a priori economic reasoning. But more often the answer will depend on the the actual quantitative values of the elasticities with which the various groups in the economy respond to price and income changes. *The main objective of quantitative research in this field is, then, to measure the network of economic relationships that explains the functioning and the results of this mutual interdependence between the two sectors.*

Let us examine this network a little more in detail. Suppose that our goal is to explain the fluctuations of the annual net income of farmers. We may start out by defining this net income as the value of sales to the nonagricultural sector plus the value of farmers' total consumption plus the value of net change in assets minus expenditures made to the non-agricultural sector. To explain changes in farm income we would therefore have to study the relations that describe farmers' decisions to produce, to purchase means of production, and to improve their farms, as well as the more technical input-output relations governing agricultural production. In attempting to explain these various economic decisions and actions within the agricultural sector, we should find that a variety of economic factors pertaining to the non-agricultural part of the economy enter into the picture—factors such as cost of farm machinery and other means of production, cost of consumers' goods purchased from the non-agricultural sector, industrial wages and

their effect upon supply of farm labor, and prices paid for agricultural products in the non-agricultural sector.

From the point of view of economic action—that is, of the decisions to produce, to consume, and so on, within agriculture—the factors relating to the non-agricultural sector might perhaps be considered as “exogenous variables,” not influenced by the farmers’ own actions. That is, one might say that the farmers plan as if these factors were imposed autonomously “from outside.” But this does not mean that the exogenous factors remain constant or that they are independent of the economic actions within the farm sector. Thus, even if we had arrived at an exact explanation of the level of farm output, farmers’ consumption, expenditures on farm machinery, savings, and the like—in terms of the factors that appear as given from outside—we should still not be able to make any *absolute* statements about the variables to be determined. For that purpose, we should also have to know how the factors that appear to be determined within the non-agricultural sector are, in turn, affected by the economic activity of the agricultural sector. For example, it might be reasonable to assume that the price level at which a given output of agricultural products can be sold will be determined by the level of income in the non-agricultural part of the economy. To determine this price level, then, it might seem reasonable first to make a guess at the probable level of non-farm income and then to calculate the price level that might be expected, given this income. But obviously this is not adequate since it is not possible to guess at the income of the non-agricultural sector without already having some idea of what the farmers’ income will be, and this in turn depends on the prices they receive. However, this situation does not mean that we are involved in circular reasoning. It simply indicates that, in addition to a theory of the supply of and demand for agricultural products, we must explain all the variable factors that enter into the analysis in terms of certain factors that are known explicitly or that are determined by autonomous government action.

This is what the economist means when he says that, in order to study the mutual interdependence between the various parts of an economy, it is necessary to establish the *complete, determinate* system of relations that ties the various economic variables together. This idea has a strong basis of tradition in economic theory, dating back to the work of the physiocrats and later to the more

explicit and elegant theories of Leon Walras. In modern times the interest of many economists has been directed towards investigations into the quantitative nature of the dependence between economic variables.

III *More Efficient Statistical Tools*

One might think that this new emphasis upon the necessity of studying many economic relations simultaneously is something that need not concern the *statistician* in his attempt to derive estimates of the individual economic relationships in the economy. For example, one might think that the statistician, when studying economic relations within the agricultural sector, could take all the outside, non-agricultural factors as given and then establish the reaction of the farmers to these various factors; or that, similarly, when the statistician is studying relations within the non-agricultural sector, he could treat the factors resulting from farmers' decisions to produce, to consume, and so on, as external to the non-agricultural part of the economy. It can be shown, however, that—from the point of view of statistical theory—this type of *partial* analysis leads to logical inconsistencies of much the same nature as the fallacy, in economic theory, of neglecting the mutual economic interdependence between the two sectors. The results of such an approach would usually not represent the basic behavior relations that we desire to measure in order to gain more profound insight into the functioning of the whole economy. This follows since the variables that appear to be exogenous to the agricultural sector are themselves influenced, in the final analysis, by the varying response of the agricultural sector to these exogenous variables. In the language of those that are familiar with statistical regression analysis, we would have situations where the variables considered as "independent variables" are themselves correlated with the residual variations of the variables that we try to "explain." Under such conditions the classical method of multiple correlation analysis is not applicable.¹ It would, in general, lead to poor and biased estimates. It might even lead to spurious results in cases where one can show that an attempt to estimate makes no sense. That is, an erroneous procedure of estimation may lead to some sort of definite numerical results even when it can be proved conclusively that the estimation problem under consideration is in fact indeterminate.

¹ See e.g. Girshick and Haavelmo, *op. cit.* pp. 79–86.

The extensive literature on the classical problem of "deriving supply and demand curves from the same data" contains many examples of the confusion that may arise when these problems are not dealt with by rational and consistent methods.

But does one have to be concerned with these delicate problems when the purpose is only to derive some mechanical formulae for making predictions? Suppose, for example, that we should find a very high correlation between farm income and non-farm income. Could we not then use this relationship to predict farm income, assuming no changes in the structure of the economy? The answer is probably, Yes, if we know what non-farm income will be. But if we do not have any information on the non-farm income, it is of little use to guess at a value for this variable and then calculate the expected value of farm income by means of the correlation mentioned above. We might as well guess directly at the farm income itself. To obtain more useful prediction formulae, it is necessary to find out how the factors one wants to predict are related to factors that can themselves be predicted on an independent basis. In order to determine what our prediction formulae should be under this approach, it is usually necessary to investigate the nature of the various behavior relations that are the characteristics of economic activity in the economy that we are dealing with.

Recent developments in statistical theory have produced new and more efficient tools for handling research problems of this nature. It is not possible here to go into detail concerning the theory and technique of these new methods.² They will often have to be fairly complicated. Suffice it to say here that they represent the theoretical and statistical counterpart of ideas, long advocated by economists and practical politicians, that a real understanding of what goes on in the various parts of the economy requires that we know the interrelations between the various economic variables that we are talking about. One must not assume "other things given" when, in fact, they are not.

IV *Usefulness in Policy*

Suppose we did succeed in deriving fairly accurate estimates of

² Readers interested in the more theoretical aspects of these problems are referred to Trygve Haavelmo: "The Probability Approach in Econometrics," *Econometrica*, 1944, vol. 12, Supplement. A somewhat more popular exposition is found in T. Koopmans, "Statistical Estimation of Simultaneous Economic Relations," *Journal of the American Statistical Association*, vol. 40, 1945, pp. 448-466.

the supply relations, demand relations, production functions, and other economic laws that together would describe the interrelations between the various economic variables in the economy. For what purpose could this network of relations be used? Obviously, such knowledge is required to satisfy our scientific curiosity. But there is also a far more practical reason. Some knowledge of the nature of the mutual interdependence between the economic factors in the various parts of the economy is obviously a prerequisite for intelligent formulation of over-all government policies such as policies of taxation and subsidies, public spending, price regulations and rationing. Political debates on economic policies are often chiefly concerned with the desirability or non-desirability of the objectives of these policies rather than with the specific means by which such objectives might be reached. The means of reaching a certain objective might, to the politician, seem direct and obvious. For example, suppose that a political majority is of the opinion that farmers have unduly low incomes. As an immediate remedy it might seem appropriate for Congress to pass a law guaranteeing higher prices for farm products. But economic thinking, even of the crudest type, would almost immediately lead to the observation that one must also consider the indirect effects of such measures upon other parts of the economy, as well as the repercussions of these effects upon the economic policy under consideration. Without a rational analytical model of how the economy works as a whole, it is usually almost hopeless to keep track of these repercussions.

One might ask how the knowledge of the network of economic interrelations, describing the structure of the economy *before* a certain measure of policy is introduced, could help in describing what the economy would look like *after* the new policy is put into operation. The answer to this question will, of course, depend upon the nature of the policy or policies that are being considered. Some policies merely change the numerical values of certain economic variables which are already subject to government decision and which the individual private sectors of the economy already are accustomed to consider as being outside their sphere of influence. Speaking technically, this means that we could calculate the effects of changes in government policy simply by inserting the new values of these variables into the old behavior relations of the various private sectors. A change in the tariff of some imported product, or changes in the rates of taxation under a given tax system, are

examples. Other policies may be such that they influence the behavior of individuals or groups in a manner that can be determined by a priori considerations. Still other types of policies may disrupt the behavior patterns of some sectors of the economy while leaving other sectors unchanged. Thus, for example, a regulatory policy with respect to the supply of a commodity may not affect the behavior pattern on its demand side; one could then use the old demand function to calculate the effects of such a policy but not the previous supply function.

Whatever the circumstances, it is of no help to take the point of view that predictions of this type, based on past experience, are impossible. The practical administrator also makes use of simplifications, broad abstractions, and rough approximations. This is unavoidable. The economist who engages in quantitative research believes in stating more openly and explicitly what these simplifications and abstractions are, in order that their implications may be studied in a rational fashion. In this way he avoids piling logical inconsistencies and errors in reasoning on top of the mistakes that he—as well as everybody else—will necessarily commit in attempting to comprehend the full complexity of economic life.

The increasing research activity along the lines we have indicated is sometimes considered as a symptom of a trend in the direction of more government planning. This might cause shortsighted opposition to aiding such research work. To this argument, however, there is a simple answer—namely, that, given a decision upon a certain objective of government planning of some kind, the objective can probably be reached more efficiently and with less direct restriction upon the freedom of action of the individual private sectors in the economy if we know something definite about the intricate network of interdependence underlying the functioning of the whole economy.

*V An Appendix to Illustrate the Methods of Model-
analysis: The Demand for Food and Its Relation to
the National Economy*

In order to develop a rational economic model it is desirable to start with a precise classification of the various groups in society according to their principal economic actions. For our purpose, here, let us first divide the economy into two groups: the consuming sector and the producing sector. (One and the same person might

appear in both groups according to the type of action considered.) The economic function of the consuming sector is to receive income, that is, wages and profits, to spend part of this income on consumer goods, and to save. The economic function of the producing sector, on the other hand, might be considered as the paying of income to individuals (or, to the consuming sector), and the supplying of consumer goods. If the producing sector pays out more income than it receives for sales of consumer goods, it invests. The counterpart of this investment expenditure—that is, of this excess of income paid out over receipts—consists of the value of the net increase in inventories plus the value of the net increase in plant and equipment in the hands of the producing sector. We may also consider exports and imports as passing through the hands of the producing sector, in which case there might be an additional counterpart to investment expenditures as defined above, namely, the net increase in foreign balances.

Let us now divide the producing sector into two sub-sectors according to the type of consumer goods supplied. Let Sector 1 be the sector producing and supplying food to consumers and Sector 2 the sector producing and supplying non-food consumer goods. Thus, Sector 1 will cover farms, processing industries, food dealers and so on. A similar interpretation applies to Sector 2. Each of the two sectors will make certain income payments to individuals. There will also be a certain transfer of goods and services between two producing sectors, but this transfer does not by itself affect the total income payments to individuals (or, if we disregard taxes, “disposable income”).

Let us introduce the following symbols:

- 1) x_1 = volume of food sold to consumers per year
- 2) x_2 = volume of non-food sold to consumers per year
- 3) P_1 = price per unit of x_1
- 4) P_2 = price per unit of x_2
- 5) I = total annual net investment expenditures of the two producing sectors
- 6) Y = annual income of individuals
- 7) P = index of cost of living

(Effects of changes in population could be eliminated by using per capita figures for x_1 , x_2 , Y , and I .)

From what has been said above it follows that the income of individuals is given by the definition

$$(1a) \quad Y = x_1 P_1 + x_2 P_2 + I,$$

or, what amounts to the same,

$$(1) \quad \frac{Y}{P} = x_1 \frac{P_1}{P} + x_2 \frac{P_2}{P} + \frac{I}{P}.$$

This definition must hold regardless of the value of x_1 , x_2 , P_1 , P_2 , and I . The question is now whether we can say something more about these variables.

There seems to be rather strong theoretical and empirical evidence that total consumers' expenditures can be considered as a function of income, provided consumer expenditures and income are both deflated by an index of the cost of living. And, furthermore, this relationship seems to be approximately linear. Let the index of cost of living, P , be defined by

$$(2a) \quad P = e_1 P_1 + e_2 P_2, \text{ or,}$$

$$(2) \quad e_1 \frac{P_1}{P} + e_2 \frac{P_2}{P} = 1$$

where e_1 and e_2 are the (constant) weights of food and non-food respectively. Our statement about the behavior of total consumers' expenditures thus means that we can write

$$(3a) \quad \frac{x_1 P_1 + x_2 P_2}{P} = a_1 \frac{Y}{P} + a_0$$

where a_1 and a_0 are certain constants, a_1 being the "marginal propensity to consume." Combining this equation with the definition (1), we obtain

$$(3) \quad \frac{Y}{P} = a_1 \frac{Y}{P} + a_0 + \frac{I}{P}.$$

The question now arises as to how the consumers divide their expenditures between food and non-food. If we make an assumption as to how much people will spend for food, this assumption, together with (3a), implies an assumption as to the demand for non-food. Empirically, it has been found that the demand for food can be described fairly well by a linear function of the food price and the income when the latter two variables are deflated by an index of the cost of living. We are therefore led to the statement

that

$$(4) \quad x_1 = b_1 \frac{P_1}{P} + b_2 \frac{Y}{P} + b_0.$$

We now have four equations between our variables, but there are, altogether, 7 variables, as described above. The remaining three "degrees of freedom" are essentially due to the fact that we have not yet said anything about the decisions to supply x_1 and x_2 and the decisions that determine the investment expenditures I . In order to explain *past* observations of our variables we should have to study the nature of these decisions, their dependence upon prices, sales and perhaps other variables. Here we shall not do this. Instead we shall study the effects upon P_1/P , P_2/P , and Y/P of *alternative direct decisions* regarding the variables x_1 , x_2 , I . In other words, we shall attempt to answer questions of the following type: Suppose that the two producing sectors were in a position to decide autonomously upon the quantities x_1 and x_2 and the amount of investment expenditures I , while the consuming sector behaves according to (3a) and (4); how would changes in these decisions of the producing sectors affect real income, Y/P , and the prices P_1/P and P_2/P ? These are questions to which one would like to have the answers if for example one were to consider introducing some new economic policy under which x_1 , x_2 , and I would *in fact* be subject to autonomous regulation.

It is seen that the answer to such questions cannot be obtained by considering any one of our equations taken alone. We have to consider the equations as a *system*. The direct and obvious method would then be to solve our system of four equations (1), (2), (3), (4), expressing each of the variables, P_1/P , P_2/P , P and Y/P , in terms of x_1 , x_2 , and I .

The solutions turn out to be fairly complicated expressions and we shall not take up space by giving all of them. But, as an example, let us derive the solution for the price of food, P_1/P . By simple, but somewhat tedious algebra, the following expression is obtained:

$$(5) \quad \frac{P_1}{P} = \frac{e_2(a_0b_2 + a_1x_1 - a_1b_0) - b_2x_2}{a_1b_1e_2 + (x_1e_2 - x_2e_1)b_2}.$$

Similar formulae could be derived for P_2/P , Y/P and P .

What the formula (5) shows is this: Suppose the food producers were to change x_1 by a certain amount, the supply of x_2 and the investment expenditures I remaining constant. Then the effect of this change upon the real price of food, P_1/P , would depend both upon the numerical values of the parameters $a_1, a_0, b_1, b_2, b_0, e_1, e_2$ and upon the level of the variables x_1 and x_2 . In other words: The total effect, upon price, of a change in quantity supplied is not given by any simple "elasticity of demand," of the commodity in question, but depends—in a more complicated manner—upon the whole structure of the economy.

There is a simpler and more elegant way of studying effects of this type. Let us first re-write our system (1)–(4) using the notations

$$\frac{P_1}{P} = p_1$$

$$\frac{P_2}{P} = p_2$$

$$\frac{Y}{P} = y.$$

Our system then reads:

$$(1') \quad y = x_1 p_1 + x_2 p_2 + \frac{I}{P}$$

$$(2') \quad e_1 p_1 + e_2 p_2 = 1$$

$$(3') \quad y = a_1 y + a_0 + \frac{I}{P}$$

$$(4') \quad x_1 = b_1 p_1 + b_2 y + b_0.$$

Now let us consider the effect upon p_1, p_2, y and P of a change in x_1 , keeping x_2 and I constant. This means that we are interested in calculating the partial derivatives

$$\frac{\partial p_1}{\partial x_1}, \quad \frac{\partial p_2}{\partial x_1}, \quad \frac{\partial y}{\partial x_1}, \quad \text{and} \quad \frac{\partial P}{\partial x_1}.$$

These derivatives are partial in the sense that x_2 and I are kept constant. If we knew these partial derivatives we could, obviously, also calculate the corresponding elasticities $(\partial p_1 / \partial x_1)(x_1 / p_1)$ etc. The problem therefore is to obtain these partial derivatives from

the system (1')-(4'). To solve this problem we differentiate each of the equations (1')-(4') with respect to x_1 , keeping x_2 and I constant. This yields, after rearranging the terms, the following 4 equations from which to determine the 4 unknown partial derivatives.

$$\begin{aligned}
 & \frac{\partial y}{\partial x_1} - x_1 \frac{\partial p_1}{\partial x_1} - x_2 \frac{\partial p_2}{\partial x_1} + \frac{I}{P^2} \frac{\partial P}{\partial x_1} = p_1 \\
 & e_1 \frac{\partial p_1}{\partial x_1} + e_2 \frac{\partial p_2}{\partial x_1} = 0 \\
 & (1 - a_1) \frac{\partial y}{\partial x_1} + \frac{I}{P^2} \frac{\partial P}{\partial x_1} = 0 \\
 & b_2 \frac{\partial y}{\partial x_1} + b_1 \frac{\partial P_1}{\partial x_1} = 1.
 \end{aligned}
 \tag{6}$$

This is a system of four linear equations in four unknowns, namely the four partial derivatives involved. The determinant of the coefficients is:

$$\begin{aligned}
 & \begin{vmatrix} 1 & -x_1 & -x_2 & \frac{I}{P^2} \\ 0 & e_1 & e_2 & 0 \\ (1 - a_1) & 0 & 0 & \frac{I}{P^2} \\ b_2 & b_1 & 0 & 0 \end{vmatrix} \\
 & = \frac{I}{P^2} [a_1 b_1 e_2 + (x_1 e_2 - x_2 e_1) b_2].
 \end{aligned}
 \tag{7}$$

The solutions of (6) are obtained by ordinary methods of solving linear equations. The solutions, written as elasticities, read:

$$\frac{\partial y}{\partial x_1} \frac{x_1}{y} = \frac{b_1 e_2 p_1 + e_2 x_1 - e_1 x_2}{a_1 b_1 e_2 + (e_2 x_1 - e_1 x_2) b_2} \frac{x_1}{y}
 \tag{8}$$

$$\frac{\partial p_1}{\partial x_1} \frac{x_1}{p_1} = \frac{e_2 (a_1 - b_2 p_1)}{a_1 b_1 e_2 + (e_2 x_1 - e_1 x_2) b_2} \frac{x_1}{p_1}
 \tag{9}$$

$$\frac{\partial p_2}{\partial x_1} \frac{x_1}{p_2} = \frac{-e_1 (a_1 - b_2 p_1)}{a_1 b_1 e_2 + (e_2 x_1 - e_1 x_2) b_2} \frac{x_1}{p_2}
 \tag{10}$$

$$(11) \quad \frac{\partial P}{\partial x_1} \frac{x_1}{P} = \frac{P^2(1 - a_1)(-b_1e_2p_1 - e_2x_1 + e_1x_2)}{I(a_1b_1e_2 + (e_2x_1 - e_1x_2)b_2)} \frac{x_1}{P}.$$

In exactly the same manner one could derive partial derivatives, or elasticities, with respect to changes in x_2 or I . (The determinant (7) remains the same, but the right-hand side of (6) will change.) If we knew the numerical values of the parameters involved in (8)–(11), we could calculate the derived elasticities. These elasticities will obviously depend also on the level of the variables involved. Certain approximate estimates of the parameters involved have been obtained from data for the United States 1922–41.³ The estimates of course depend upon the units of measurement of the various variables involved. Suppose we choose the units of measurement in such a way that the values of the price indices P_1 , P_2 , and P during the base period 1935–39 are all equal to 1 and such that the average value of real income y during this period is also equal to 1. It is thus found that the average values of x_1 , x_2 , and I during 1935–39 were approximately

$$x_1 = .25$$

$$x_2 = .65$$

$$I = .10.$$

The weights e_1 and e_2 of the index of the cost of living should, roughly speaking, be proportional to x_1 and x_2 ,⁴ that is

$$e_1 = .25 \frac{100}{90}$$

$$e_2 = .65 \frac{100}{90}.$$

In these units of measurement the following approximate estimates were found for a_1 , b_1 and b_2

³ The data used were: Per capita disposable income and per capita consumers' expenditures (Department of Commerce data), Index of cost of living and index of retail food prices (Bureau of Labor Statistics series), and index of per capita food consumption (Bureau of Agricultural Economics). For details of calculations involved, see M. A. Girschick and T. Haavelmo: *op. cit.* pp. 99–109.

⁴ The actual weights used in the BLS index of cost of living are slightly different because the weights of the BLS index refer to the lower income groups only.

$$a_1 = .7$$

$$b_1 = -.06$$

$$b_2 = .07.$$

Using these estimates we obtain the following values of the elasticities above, valid when the values of the variables involved are reasonably close to their values in the base period 1935-39:

$$(8') \quad \frac{\partial y}{\partial x_1} \frac{x_1}{y} = .36$$

$$(9') \quad \frac{\partial p_1}{\partial x_1} \frac{x_1}{p_1} = - 3.75$$

$$(10') \quad \frac{\partial p_2}{\partial x_1} \frac{x_1}{p_2} = 1.45$$

$$(11') \quad \frac{\partial P}{\partial x_1} \frac{x_1}{P} = - 1.07.$$

Stating our results in words, they read as follows:

If investment expenditures, I , and the output of non-food consumer goods, x_2 , were to be maintained at constant levels, a 1% increase in the output of food would

- 1) *increase* the real income of consumers by about .36%,
- 2) *decrease* the real price of food by about 3.75% (which means that the real income derived from producing food would decrease by about 2.75%),
- 3) *increase* the real price of non-food consumer goods by about 1.45%, and
- 4) *decrease* the cost of living by about 1.10%.

The reliability of these conclusions depends, of course, upon the accuracy of the statistical measurement of the parameters involved, their sampling errors etc., and much careful research is yet to be carried out to check the tentative estimates we have used above. But our preliminary results might perhaps serve as an illustration of the type of analysis that would be required in order to study the final, net effects of certain changes in the structure of the economy. To summarize, a study of this nature will usually involve the following analytical steps:

- 1) A precise description and formal analysis of the *new* structure to be considered.
- 2) A precise description of the *prevailing* structure in order to find out what parameters or properties of the prevailing structure will carry over into the new structure.
- 3) Estimation of these parameters, or properties, common to the two structures, on the basis of observations resulting from the prevailing structure.
- 4) The use of such estimates to predict results under the new structure *before* it is put into effect.

Above we have dealt mainly with steps 1) and 4), assuming the results of 2) and 3) to be available from other studies.

A NEGLECTED POINT IN THE TRAINING OF AGRICULTURAL ECONOMISTS

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ECONOMIC theory is a normal part of training in agricultural economics. Some institutions require more theory than others but it is not omitted in any of the recognized schools. Since our title is half "economic" and since formal economics is largely theoretical, this requirement seems somehow justified.

But how many students ever stumble upon the real justification? From personal experience and contacts with other students I am led to believe that theory is usually placed in one of three categories by prospective agricultural economists: It is considered at one extreme to be a necessary evil along with languages; or it is grouped with such "broadening" courses as history and government—valuable but outside our immediate professional field; or it is viewed at the other extreme as the real touchstone of knowledge. The proportion in which student attitudes divide among these categories varies from place to place. In any case, however, any of the three types of attitude are evidence that the chasm between courses in agriculture and those in economics has been found too wide to span; in none of them is theory placed in a working relationship with our "practical" tools. Nor are courses commonly available from which it is possible to gain the perspective for visualizing such a working relationship.

This paper is an attempt to explore some of the material and thinking that might form connective tissue between the theoretical and the practical. It deals principally with research methods because it is in research that the need for a union between theoretical and practical approaches is most acute. In research both abstract thought and data accumulation and analysis must be used as every day tools of the trade. Much of the subject matter considered is historical. An understanding that will open a view to the future must be based upon a study of what we have inherited.

Our methodological heritage is intermingled with conflicts concerning scope and ends, but the latter can form a separate chapter. The study of methods alone is sufficient background for grasping

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the tangible contributions theory may make to systematic economic inquiry. Scope is not directly involved and it is sufficient to assume the end of economic inquiry to be the attainment of knowledge for its own sake as in the natural sciences.

Economics originated as a deductive "science." Seeking in the early stages of its development to teach what should be rather than to discover what is, it could not have been other than deductive. In its deductive character it was consistent with the Greek belief that all knowledge is a derivative of "pure reason." This belief, later implicit and concealed, guided its development for many centuries and much of today's economic thinking reflects it. Economics began to lose its normative character, but not its deductive approach, at the hands of the Mercantilists and the Physiocrats and Adam Smith helped to draw that line more clearly. Although this contributing element was gradually removed, the traditional method remained largely intact. Smith was a keen observer of the events of his world but his methods of abstraction have been longest remembered.

Inductive methods have come more slowly to economics than to most other branches of academic endeavor. Probably this is traceable to the impossibility of controlled experimentation, the multitude of factors operating in the economic world, the importance of human elements too close for objective observation, and to the slow development of statistical devices suitable for controlled observation. Inductive methods were employed in a loose, qualitative fashion by the early economists, and the theoretical usefulness of such devices was considered in some of the first recorded discussions of methods in economics.¹ But only in the past half century have empirical, inductive studies begun to make a material contribution in the field as a whole. Perhaps it is not surprising that confusion and conflict often have attended these attempts to break from the path of tradition. In many instances the attempts were made because of reactions against the older, entrenched ideas, and so they have tended to introduce a dualism into the field, with the theorists on the one hand and the empiricists on the other. Theorists have tried to maintain their position as superior to that of the "fact finders," envying the latter, no doubt, for the rather large financial support they often receive. The "fact finders" often

¹ Rev. Thomas R. Malthus, *Principles of Political Economy*, Wells and Lilly, Boston, 1821.

have been eager to differentiate themselves from the theorists lest they fall into ways not sufficiently "productive" to sustain the interest bringing them their support. In this dualism "facts" have come to be viewed, on the one hand, as the sole and direct source of all knowledge and, on the other, as the anvil upon which thought derived "laws" are to be tested or even as only the models upon which these "laws" are to be tried in quest of a fit. A page from the book of methods in the physical sciences is appropriate at this point.

It seems reasonably well settled that progress in the physical sciences is dependent upon the use of an hypothesizing-testing-hypothesizing sequence. This sequence involves both deduction and induction; deduction, to derive the implications of existing knowledge or assumptions in order to shape speculations that will guide further inquiry; induction, to distill the "summary and conclusions" from further inquiry. The essential nature of what has come to be scientific method in the physical sciences is well set forth in the following quotation from John Dewey:²

"I begin with a summary statement of the conclusions to be reached regarding the distinctively inductive and deductive phases of inquiry, and their interrelation, or functional correspondence, with each other. (1) The inductive phase consists of the complex of experimental operations by which antecedently existing conditions are so modified that data are obtained which indicate and test proposed modes of solution. (2) Any suggested or indicated mode of solution must be formulated as a *possibility*. Such formulation constitutes an hypothesis. The *if-then* proposition which results must be developed in ordered relation to other propositions of like form (or in discourse), until related contents are obtained forming the special *if-then* proposition that directs experimental observations yielding new data. The criterion for the validity of such hypotheses is the capacity of the new data they produce to combine with earlier data (describing the problem) so that they institute a whole of unified significance. (3) The nature of the interrelation or functional correspondence of these two phases of inquiry directly follows. The propositions which formulate data must, to satisfy the conditions of inquiry, be such as to determine a problem in the form that indicates a possible solution, while the hypothesis in

² John Dewey, *Logic, The Theory of Inquiry*, Henry Holt & Co., New York, 1938, p. 427.

which the latter is formulated must be such as operationally to provide the new data that fill out and order those previously obtained. There is a continued to-and-fro movement between the set of existential propositions about data and the non-existential propositions about related conceptions."^{3,4}

The dualism in economics splits the hypothesizing from the testing and thus has prevented the construction of this stairway of alternate steps by which the physical sciences have progressed. The dualism is slowly breaking down from point to point, however, and belief is currently increasing that at least some of the methods of the physical sciences are useful in the social sciences as well. The activities of the National Bureau of Economic Research provide an example. Efforts like those that culminated in Henry Schultz's "The Theory and Measurement of Demand"⁵ are others. Professor Schultz's work represents an outstanding attempt to combine the processes of theoretical study and empirical observation. He started with the most advanced formulations of demand theory then current and developed them as guides to his selection of data and to the determination of the general form and direction of his analyses. He combined this use of theory with some of the most advanced techniques of statistical reasoning to arrive at conclusions about real processes in a real world.

Until the recent past, however, recognized economics has been preponderantly deductive, and even in the present the great bulk of economic writing is the result of applying this technique. In the study of theory as part of a rounded preparation for research and teaching in agricultural economics it is important to understand how this branch of thinking has evolved and the nature of the position in which its devotees hold themselves.

As a deductive study, economics has clung closely to certain types of formal logic. In this position it has occupied the place of a weaker brother, looking to this logic for ready made rules of thought by which to construct a superstructure from a limited set of premises; looking to it also for support of its claim to the position of a

³ This quotation from Dewey should not be construed as indicating full agreement with his notions in respect to what constitutes scientific procedure in the social sciences. (*Ibid.* Chapter XXIV.)

⁴ A striking example of the use of this method is set forth by R. A. Fisher in an article entitled "The Rhesus Factor, A Study in Scientific Method," in the January, 1947 issue of the *American Scientist*.

⁵ Henry Schultz, *The Theory and Measurement of Demand*, The University of Chicago Press, Chicago, Ill., 1938.

science. Logic, as the Greeks formulated it and as its main stream has run nearly to the present day, has been a willing brother. Its forms provided the illusion of ready made rules for the thought derivation of knowledge, and its own approach to the attainment of knowledge could be used as a justification by parallel for the claim of economics to scientific standing.

J. E. Cairnes was among the first to write under the title of scope and method in economics. His dependence upon contemporary thought in the field of logic is evident in his expressed belief that he had demonstrated the scientific standing of economics as in no respect less certain than that of chemistry or physics by establishing the "fact" that it is based upon "unquestionable" elements as premises and that it employs "strict logical accuracy."⁶ Cairnes went even further to the novel conclusion that economics was especially privileged by being able to start from a point whose attainment required long and arduous effort in the physical sciences. He maintained that our intuitive knowledge of human nature was such that economics could start where physics stood after the discovery of the gravitational law and similar fundamentals.⁷ He maintained, moreover, that economic laws "can neither be established nor refuted by an appeal to the records of such phenomena—that is to say, by statistical or documentary evidence bearing on the course of industrial or commercial affairs."⁸

The attitudes and beliefs expressed by Cairnes can be traced through the writings of J. N. Keynes⁹ to those of Lionel Robbins¹⁰ in the present day. They are also implicitly evident in the writings of other economists who never addressed themselves directly to the subject of methods. Robbins' recent book reveals its heritage clearly. He considers that the masters who preceded him wrote the final chapter in the book of methodology.

"It is the object of this Essay to arrive at conclusions which are based on the inspection of Economic Science as it actually exists. Its aim is not to discover how Economics should be pursued—that controversy, although we shall have occasion to refer to it *en*

⁶ J. E. Cairnes, *Political Economy: Its Character and Logical Method*, Harper and Brothers, New York, 1875.

⁷ *Ibid.*, p. 87.

⁸ *Ibid.*, p. 110.

⁹ J. N. Keynes, *Scope and Method of Political Economy*, Macmillan and Company, London, 1891.

¹⁰ Lionel Robbins, *An Essay on the Nature and Significance of Economic Science*, Macmillan and Company, London, 1932.

passant, may be regarded as settled as between reasonable people—but rather what significance is to be attached to the results which it has already achieved.”¹¹ Professor Robbins does admit the possible usefulness of empirical evidence for two purposes, but these only.

“The first and the most obvious is the provision of a check on the applicability to given situations of different types of theoretical constructions.”

“But, secondly, we may expect of realistic studies, not merely a knowledge of the appropriate application of particular theories, but also the exposure of areas where pure theory needs to be reformulated and extended.”¹²

These purposes clearly are not such as might effect any reciprocal modifications in the theories. They are carefully framed to be consistent with Robbins’ belief that theory represents inviolable laws revealed to those who have the capacity and willingness to think deeply. Theories are not to be tested against fact; they are merely to be tried on facts until those fit to fill the bill are found. In some instances, though, it may be worth while to file orders with the thinkers if important areas are found that have not been covered as yet.

Robbins is unwilling to concede that “Quantitative Economics” has contributed a single iota directly to the field as a science, and pronounces the judgement that “. . . most of the investigations involved have been doomed to futility from the outset and might just as well never have been undertaken.”¹³

Keynes is the link in the classical lineage between Cairnes and Robbins, and is true to the general form of that school. His position on the methodological issue is indicated in his statement that “. . . it is held that on account of the variety and complexity of the influences to which economic phenomena are subject, the method of specific experience or direct induction is inadequate to yield more than empirical generalizations of uncertain validity.”¹⁴ Keynes is somewhat more tolerant than Robbins, however, of the idea that studies of fact can contribute to economic science. He says that “. . . according to the special department or aspect of

¹¹ *Ibid.*, p. 72.

¹² *Ibid.*, pp. 106, 107.

¹³ *Ibid.*, p. 102.

¹⁴ J. N. Keynes, *op. cit.*, p. 14.

the science under investigation, the appropriate method may be either abstract or realistic, deductive or inductive, mathematical or statistical, hypothetical or historical."¹⁵ Keynes' position is less extreme, but he does not exhibit an understanding of the way these various kinds of activities are interrelated and interdependent in the scientific procedure of the physical sciences. He treats them on an either-or basis instead of pointing out their interdependencies.

Economists from early times have looked with admiration and envy upon the physical sciences. The leadership of these sciences in human efforts to acquire knowledge has been generally recognized and economists have tried to emulate their fellow leaders. They have mistakenly believed that the form of the end product, rather than the processes by which that product is derived, is the basis upon which activities are to be classified as scientific or otherwise. Accordingly, they have focused attention upon deriving "laws" that could be set in parallel with those of physics and chemistry. Because experiments were not possible in economics and because economists were too impatient to be occupied with the study of minutiae, they seized upon and perpetuated the deductive approach to the derivation of these laws. There has been created through the years a massive testimonial to the efficacy of deduction as the sole source of economic knowledge and this has been done in such a way that Robbins' recent statements are not so utterly incongruous in the economic context as they would be in the natural sciences.

Thus economists' efforts to emulate scientific leadership have lead them strangely enough down an unscientific byway. The products of economic "science" look scientific but the procedure that lies behind them has little in common with the hypothesizing-testing techniques of the recognized sciences. Hoping to become one thing, economics has actually become another. Operationally viewed, it has grown into a parallel with mathematics, a branch of formal logic, rather than into a field of scientific stature. Economists have busied themselves with the task of developing the implications of selected assumptions, as have the mathematicians, without attempting to verify either the assumptions or the conclusions. Physicists, meanwhile, have been using deduction as a guide to empirical study. Not in recent times have they appealed to

¹⁵ *Ibid.*, p. 30.

deduction as the final truth *ab extra*. In their work, deduction and experimentation has gone hand-in-hand. Einstein's theories, for example, rested firmly upon the empirically established content of physical science at the time they were advanced and since then have been subjected to far reaching tests.¹⁶

But theoretical economists have not felt bound to the slow pace of any experimental (or observational) procedure and so have felt free to attack a great range of problems. Their efforts remind one of the early alchemists who poured considerable effort into attempting the transmutation of metals before one among them became "preoccupied with the irrelevant" and discovered the synthesis of urea. Urea probably smelled as bad then as it does now, but from this discovery grew many years of effort that has brought us finally to where transmutation of certain metals is an accomplished reality. Or economists might be compared to the early medics. No one can doubt that they were dealing with important issues—they were issues of life and death for thousands. But somehow those issues kept until thousands of man-years of work were put into painstaking studies of how the human body functions and how pathogenic agents live and spread. Economists, feeling the immediate importance of their issues, were equally impatient and only today are beginning to settle down to mundane tasks like synthesizing urea and dissecting cadavers.

Not even many concepts of economics have been designed so that they can function in studies of the economic forces that operate about us. Concepts are the common denominators of any science and progress in acquiring knowledge is closely related to the manner in which concepts are constructed. This is illustrated nowhere more clearly than in physics where recent progress awaited the conceptual reformulation contributed by Einstein. Economists have considered their efforts completed with the construction of internally consistent deductive systems and therefore have shaped their concepts to fit such systems. Marshallian demand illustrates the nonoperational character of classical theory forms. In order that demand be a suitable element in an undeniably accurate piece of deductive reasoning it has been so defined that in the real world of change it is an instantaneous thing. Before empirical studies of

¹⁶ P. W. Bridgman, *The Logic of Modern Physics*, Macmillan Company, New York, 1928.

demand could be made it was necessary to convert this transitory concept into an operational one.¹⁷

T. W. Hutchison has given us an admirable critique of the methods of classical economics in his *Significance and Basic Postulates of Economic Theory*.¹⁸ Yet he actually has said little that had not already been said, much of it by men who in practice themselves used the classical methods. Malthus in his time recognized the weakness of theory without records of empirical observations. Smith before him, though not explicit, must have felt the same about the matter else he would not have so liberally illustrated his *Wealth of Nations* with accounts drawn from his observations. Mill, too, and Senior pointed out the pitfalls that may attend the "hypothetical treatment of the science," and, of course, the historical school in Germany was in part a reaction against the classical methods. Jevons and later Pareto and Edgeworth emphasized the need for inductive studies. Marshall and especially Pigou point out in their works of nearly pure theory that greater knowledge of economic facts is needed and Pigou makes a real effort to construct operational concepts for his measures of welfare.

Thus not all of the classical economists have taken the extreme view expressed by Robbins. But while exhortations to inductive study are not hard to find, comparatively little has been done to spell out a basis for effectively contributing generalizable relationships through observational analyses. Many of the economists who in the abstract have written of the need for empirical study have confined themselves to deduction in their own undertakings. Few of those who made penetrating criticisms of the deductive approach carry through to constructive criticisms of economic concepts, much less to suggestions of how concepts once made operational can be employed in actual research. Though one may find Hutchison profitable reading he necessarily feels that the book is completed before the job is more than begun. If Hutchison had carried his work on through an examination of economic concepts in the manner Bridgman has done for physics,¹⁹ his contribution would be more than destructive. If then he had gone beyond the examination of concepts to an analysis of the possible place of statistical

¹⁷ Henry Schultz, *op. cit.*

¹⁸ T. W. Hutchison, *The Significance and Basic Postulates of Economic Theory*, Macmillan and Co., London, 1938.

¹⁹ Bridgman, *op. cit.*

reasoning and other types of inductive techniques in economic research, his contribution might have been very substantial.

Statistics is being slowly built today into social science research and there are those who believe that it holds possibilities comparable to the experimental method in the physical sciences.²⁰ The inferential elements of statistical reasoning, the null hypothesis, tests of significance, and fiducial limits, as well as idiographic devices for analyzing data, are relatively new. Newer yet is some of the mechanical and electronic equipment that is capable of handling great volumes of mass data. It is hardly to be wondered that economists and others frequently expose their ignorance by referring to statistics as the mere accumulation and arrangement of raw or nearly raw data. Nor is it surprising that few have speculated on how far statistics may make it possible to convert economics from exercises in formal logic to a truly scientific undertaking. Clearly, statistics as yet has substantial limitations. There are many phenomena that seem to have no repetitive pattern or at most short run stability. This may be because our phenomenal units are improperly chosen or it may be because sums of component patterns appear as though they were random values. Or, indeed, it may be that we must await the discovery of tools beyond statistics before we can bring some phenomena within the scientific realm. Statistics is developing rapidly, however, and already opens many unexplored vistas into future possibilities.

Inductive techniques are being built into the social sciences—where does this leave economic theory? Though the positions taken by some economic theorists seem extreme and reactionary, do they not have lessons to teach? The concepts of theory can be criticised as nonoperational, the hypotheses as often too far removed from reality to be practical and the conclusions as frequently no more relevant than the answers to hypothetical problems in a calculus text. Is this so serious an indictment that we are justified in pushing theory overboard?²¹ Wesley C. Mitchell answers: "Economic theory, I fervently hope, will not be neglected;

²⁰ Jevons has been quoted as saying: "I know not when we shall have a perfect system of statistics, but the want of it is the only insuperable obstacle in the way of making Economics an exact science." See Henry L. Moore, "The Statistical Complement of Pure Economics," *Quarterly Journal of Economics*, November, 1908.

²¹ In places it would be heresy to ask this question, yet it seems no more extreme than Robbins' view that empirical studies should be relegated to some level of lower life than the "science" of economics.

but more vigorous efforts will be made to test the assumptions on which reasoning proceeds, or the conclusions it reaches, or both, for conformity to the conditions we need to understand. Empirical workers in turn must have learned from recent experience that they cannot get significant results if they rely upon fuzzy concepts."²² His belief seems firm that only through integration of theory and empirical research can "an economics worthy to be called a science" be created. There is an increasing number of economists who believe that economic theory can provide part of the starting point, if only that, from which a science of economics can be built. And they go beyond this belief and hold that induction and deduction must proceed hand in hand, so closely interwoven that to separate them would require picking but parts out of individual studies, individual books. Conceptual reformulation so badly needed for effective empirical research in many branches of economics is an example of a task in theory that cannot be done apart from the empirical researches themselves.

This view of the place of theory in economic research is entirely consistent with the generally accepted principles of scientific research in the physical sciences. Economics' peculiarity rests in the fact that it has a vast body of prepared theory with no roots in the real world. Much of it will be discarded in time, perhaps, and the kind of interwoven, evolving theory developed that serves the physical sciences so well. A remark by Albert Guerard, quoted by Joseph S. Davis²³ serves well to remind us of the importance of grasping and developing theory as one of the cornerstones of scientific procedure: "Much of our research is but an arduous flight from the necessity of thinking."

This brief tour through the history of methods in economics uncovers much disagreement among men of standing. Although each in his own mind reaches conclusions on such a tour, one cannot fairly claim to write a conclusion for all. Yet it seems not out of place to set forth some points of the kind that might compose a working philosophy in agricultural economics. Some such philoso-

²² Wesley C. Mitchell, "Empirical Research and the Development of Economic Science," *Economic Research and the Development of Economic Science and Public Policy*, Twenty-Fifth Anniversary Papers, National Bureau of Economic Research, New York, 1946, p. 10.

²³ Joseph S. Davis, "Whither Now?," *Economic Research and the Development of Economic Science and Public Policy*, Twenty-Fifth Anniversary Papers, National Bureau of Economic Research, New York, 1946, p. 174.

phy as the following is necessary if we, with our frequent bias for "facts," are to grasp theory as a tangible tool and use it as an operational one. If points such as these, along with the thinking that leads to them, could be put across to graduate students in this field the place of theory in a rounded program of training would become apparent.

1. All economists should be familiar with formal economic theory and should have a general knowledge of the steps by which it has developed. Economists should gain this familiarity and knowledge for three principal reasons. First, any scientific endeavor requires the ability to carry out accurate deductive reasoning and the study of theory can develop this ability. Second, theory can suggest the kinds of hypotheses that will be useful in the study of economic phenomena. Third, the study of theory creates a realization of the importance of carefully framed concepts and indicates the manner in which they are constructed. (It does this though it be unable to supply ready made the operational kind of concepts needed in scientific inquiry.)

2. Economic theory is not restricted to the formal kind presented in text books and in established theory courses. Formal theory generally is more closely reasoned, more compactly integrated and more readily accessible than theory in other forms but all except the barest data gathering projects involve ideas and reasoning processes. Theory encompasses all efforts to explore the implications of bodies of knowledge or of sets of assumptions and includes a wide variety of attempts to formulate concepts and hypotheses.

3. Every research economist should be familiar with the business and production problems of the particular branch of economic enterprise he plans to study. This is one of the prime requisites for undertaking the inductive phases of research.

4. For a similar reason, every research economist should master statistics sufficiently to make it a tool readily available to him and efficient in his hands. He need not be able to build the tool nor improve it but should be able to talk with men in the statistical tool production business.

5. Every economist should recognize that we are well over a hundred years behind the physical and biological sciences and that we cannot catch up merely by producing something only superficially similar to the real thing. We must study many "un-

important" and "insignificant" things before we can even approach a scientific discussion of most topics treated so glibly by theorists today.

6. A man trained in theory alone may be a great teacher and a great thinker. In this he may make a most valuable contribution. Generally, however, he will be ill qualified to derive warranted assertions about real economic processes. He may also defeat the good he accomplishes as a teacher and thinker by concerted efforts to perpetuate the testimonial wall around the pedestal upon which theorists have been inclined to place themselves.

7. A man without training in theory is likely to frame his concepts loosely and may fail to recognize that carefully constructed hypotheses are important as guides to the collection and analysis of data. There are "facts" without number in the economic world. Vast effort can be poured into fact accumulation without obtaining the kind of data that will lead to conclusions with sound inferential value.

INHERITANCE OF FARM PROPERTY

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THE continuity of ownership and operation of farms in the United States is broken at least once each generation by the natural processes of life and death. This transfer of property rights forms a strategic point in land tenure at which problems, confusion, and uncertainties in agriculture frequently arise. In general, these disorders stem from the destruction of the essential unity of the farm as a going concern to permit equal inheritance. It requires many years to build a farm to a highly productive and efficient business. This is especially true where emphasis is placed upon the improvement of livestock or poultry through breeding and where the restoration of the fertility of the soil is necessary. The biological nature of farm production, the attainment of knowledge and experience of farming practices, and the usual gradual accumulation of the necessary capital investment are factors in this time requirement. It is not unusual, in fact it is more often the case, to find that an individual farmer has spent the greater part of his life in attaining the ownership of a productive and efficient farm. Yet, unless proper steps are taken, the benefits of his achievements may be destroyed at his death through the dispersal of his estate among his heirs. The result is the placement of a definite limit upon the productive powers of agriculture, as each generation has to begin anew the process of building a going concern in farming.

I

The framers of democracy in this country believed that full and unrestricted ownership of land was essential to freedom of individual opportunity, dependent upon ability and initiative rather than upon birth and land-tenure status. Thus, the famous Ordinance of 1787 banned entail and primogeniture in the Northwest Territory, and soon afterwards the older colonies, one after another, abolished feudal land-tenure practices. These laws to a large extent assured that our land system would not be feudal, and they deeply ingrained in our culture the concept of equality in inheritance, i.e., equal division among heirs in the settlement of estates. Property rights in land are held in the largest possible estate—the “fee simple,” under which the landowner is permitted to pass his prop-

erty to his heirs largely as he sees fit. This freedom of devise is subject only to the minor restrictions of dower rights¹ of the surviving wife and the limitation of entailing the estate beyond the life of a living person or persons plus twenty-one years. The instrument known as a will is the means through which the landowner can express his desires before death, and in the absence of a will, the laws of the several states determine the manner in which the property is to be divided. Based on the concept of equality in inheritance, the various state statutes, while varying in some respects, provide for an equal distribution of property among heirs. These statutes, in turn, have had a marked influence on the manner in which property is transferred by will.

The establishment of fee-simple ownership of land in the United States represented a complete break from the feudal system. In this respect it assumed the nature of an experiment. Doctor L. C. Gray, writing on the success of this experiment, has the following to say:²

The inheritance laws have thus helped to prevent the development of a landed aristocracy dependent upon the soil. This influence, coupled with the predominance of other means of investment in an industrial society, has served to prevent the ownership of land in the United States from becoming a prerequisite for entrance into certain social strata or into politics, as was long the case in many older countries.

The absence of numerous large landed estates has had a beneficial influence in the development of a well-balanced agriculture, particularly in the maintenance of the American ideal—the family-sized farm.

Continuing his discussion, Doctor Gray points out the experience in England where inheritance laws in the past tended to perpetuate large estates, and in France where inheritance laws have fostered excessive subdivision of real property. He then concludes, "The American inheritance laws have tended to establish a medium between these two (English and French) extremes. Neither the restricted aggregate production and potentially bad social conditions of the large landed estates nor the inefficiency and insufficiency of the small peasant holding are favored by our systems of inheritance."

This "medium" in our inheritance laws fosters the American ideal of freedom of individual opportunity dependent upon ability

¹ Curtesy rights exist in some states.

² L. C. Gray, *et al.*, "The Causes: Traditional Attitudes and Institutions," U. S. Dept. Agr. Yearbook, *Soils and Men*, 1933, p. 116.

and initiative. Yet our inheritance laws have not been entirely free from undesirable effects. Fortunately, the destruction of the former does not appear necessary for the correction of the latter. The imperfections lie in the succession practices which have been used and these practices can be modified within the framework of the inheritance laws. Better practices, not a change in principle, is the needed approach to land inheritance problems.

II

Little research in the United States has been directed specifically toward an analysis of land inheritance problems. Most of the investigations in which inheritance has received consideration deal largely with how farmers acquire ownership of farms or with broader phases of the farm-tenure process. In both cases, the consideration given inheritance has been confined to the amount of land or the number of farms in a certain region which was acquired wholly or in part through inheritance. A search of 15 bulletins and articles (table 2) revealed that only two were directed specifically toward inheritance one of which was on the *Migration of Agricultural Wealth by Inheritance*.³ However, several additional articles should be specifically mentioned. The article by L. C. Gray et al. previously cited is an excellent discussion of the system of inheritance, and it presents a good summary of some of the more important ways in which the passing of farm property through inheritance contributes to agricultural problems.

In 1927, Professor George S. Wehrwein gave a summary of data available, and specifically pointed out that inheritance, except in cases of only one heir, usually "means recapitalization of the farm in whole or in part."⁴ Professor H. W. Hannah has presented a discussion on the various ways farm property may be held, and he suggests methods of insuring the most economic disposition of the property in case of death.⁵ In addition, some studies have been made of special arrangements, known as "bonds of maintenance,"

³ Mimeograph Bulletin No. 65, Department of Rural Economics, Ohio State University and Ohio Agricultural Experiment Station, 1933.

For further information on the migration of agricultural wealth by inheritance see: F. R. Yoder, and A. A. Smick, *Migration of Farm Population and Flow of Farm Wealth*, Washington Agricultural Experiment Station Bulletin No. 315, 1935.

⁴ George S. Wehrwein, "The Problem of Inheritance in American Land Tenure," *JOURNAL OF FARM ECONOMICS*, Vol. IX, No. 2, April, 1927.

⁵ H. W. Hannah, "Family Interest in the Ownership of Farm Land," *JOURNAL OF FARM ECONOMICS*, Vol. XXIII, No. 4, November, 1941.

which are used in transferring the title to farm land, and some writers have mentioned the "Bohemian contracts."⁶

Inheritance may assist a farmer in acquiring an estate in the land he farms in a number of ways.

1. He may inherit a farm in its entirety, as in cases where there is only one heir. (The farm may or may not be fully equipped and stocked.)

2. He may inherit a farm in part and purchase the shares of the other heirs. (He may rent rather than purchase these shares, in which the case the farm is often operated as an estate. Specific rental may or may not be stipulated.)

3. A life interest in a farm may be inherited. (This is generally the case where a man leaves his farm to his surviving wife and at her death to their children.)

4. Where a farm is subdivided among several heirs he may be assigned a small tract as his inheritance and may either purchase or rent additional land. (In some cases he may offset the small size by combining his farming activities with non-agricultural employment—part-time farming.)

5. He may inherit money or other forms of personal property with which he purchases a farm in its entirety, or makes a down-payment. (In some cases where land is already owned he may add additional land to his unit.)

6. He may receive, as an advancement on an estate, financial assistance in obtaining land.

7. He may purchase a farm from his parents or other near relatives under exceptionally favorable financial conditions.

8. He may take over the home farm before the death of his parents by giving the parents an annuity in the form of an agreement to support them for the rest of their lives according to their station in life.

The extent to which inheritance has played a part in the acquiring of farm land in the United States by each of these eight ways is not known. Even though the various studies do not include data on each or all of the different ways, the data do illustrate the im-

⁶ C. F. Wehrwein, "Bonds of Maintenance as Aids in Acquiring Farm Ownership," *The Journal of Land and Public Utility Economics*, Vol. 8, No. 4, November, 1932.

K. H. Parsons, and E. O. Waples, *Keeping the Farm in the Family*, Wisconsin Agricultural Experiment Station Research Bulletin, No. 157, 1945.

J. O. Rankin, *Landlords of Nebraska Farms*, Nebraska Agricultural Experiment Station Bulletin No. 202, 1924.

portance of inheritance in the tenure process. The United States Department of Agriculture has made estimates of the number of farms that changed ownership by various methods during the period 1942-46.⁷ During this five-year period the ownership of 5.12 farms per 1,000 farms in the United States changed through inheritance or gift and an additional 8.70 farms through administrators' and executors' sales (table 1). In relation to all changes in ownership, inheritance and estate sales accounted for one in each five transfers. Inheritance was apparently of greater importance in the older regions of the United States and of lesser importance in the Mountain and Pacific states.

Similar estimates made for 1920-26 indicate that some 12 percent of the changes during that time were through inheritance and gift.⁸ Apparently, inheritance plays a relatively small part in the total transfer of farm property. On the other hand, its importance in transferring farm property from one generation to the next is greater than the figures indicate (table 2).

The importance of inheritance in farm realty is also indicated by data from farm tenure studies, especially those investigations on the concept of the agricultural ladder.⁹ Dr. W. J. Spillman, in 1919, reported on his studies of how farm ownership was acquired in five mid-western states. Of the 2,112 farm operators included in the studies, 24 percent obtained their first farm land through inheritance. In contrast, in 1920, a similar study in Kansas showed only 11 percent of the farm operators had acquired their first farm land by this method, and in 1928, Hibbard pointed out that only 12.5 percent of the farmers in Wisconsin had inherited their farms. However, Hibbard states, "Inheritance plays a much bigger role than is indicated by the small percentage of farms acquired wholly by this method. . . . Inheritances are usually in smaller amounts than whole farms, and still oftener in the form of money than land."¹⁰ This point is substantiated by later studies. In 1931, a study of the agricultural ladder in Ohio showed that 29 percent of the farm operators acquired all of their land and an additional 10 percent

⁷ M. M. Regan, and A. R. Johnson, *The Farm Real Estate Situation, 1945-46*, United States Department of Agriculture Circular No. 754, December, 1946.

⁸ E. H. Wiecking, *The Farm Real Estate Situation, 1926*, United States Department of Agriculture Department Circular No. 377, February, 1927.

⁹ For reference to these studies see the footnotes to table 2.

¹⁰ B. H. Hibbard, and G. A. Peterson, *How Wisconsin Farmers Become Farm Owners*, Wisconsin Agricultural Experiment Station Bulletin No. 402, August, 1928, p. 15.

obtained a part of their land through inheritance. Likewise, a study in Delaware revealed similar results except the percentage of those who acquired their farm land wholly by inheritance was smaller and those in part much larger.

Several studies have reported interesting data on the importance of inheritance in the acquiring of farms by landlords. Nebraska reported in 1924 that 20 percent of the landlords had acquired their land through inheritance. This study and another made in Nebraska two years later set forth an interesting comparison be-

TABLE 1. ESTIMATED NUMBER OF FARMS CHANGING OWNERSHIP BY INHERITANCE AND ESTATE SALES PER 1,000 OF ALL FARMS, BY GEOGRAPHIC DIVISIONS, AVERAGE FOR 5-YEAR PERIOD 1942-46¹

Geographic division	Inheritance and gift	Administrators' and executors' sales ²	All methods of changing ownership
New England	6.94	6.12	53.68
Middle Atlantic	5.66	9.30	64.34
East North Central	4.78	11.08	71.88
West North Central	4.42	10.18	80.38
South Atlantic	6.76	8.78	60.74
East South Central	4.76	7.42	71.36
West South Central	5.06	6.32	69.08
Mountain	3.63	6.28	67.98
Pacific	4.32	6.50	75.86
United States	5.12	8.70	70.28

¹ M. M. Regan, and A. R. Johnson, *The Farm Real Estate Situation, 1945-46*, United States Department of Agriculture Circular No. 754, December, 1946.

² Includes all other sales in settlement of estates.

tween landlords and owner-operators, the latter reporting 23.9 percent as compared to 20 percent in the former. H. H. Turner in his study for the United States as a whole found that 27 percent of the landlords inherited a part of their land, and 11 percent inherited all the farm land they owned. Similar results were found for landlords in a study on Delaware, except here the percentage acquiring their farms wholly through inheritance was greater.

A number of other interesting relationships is found in these studies. Professor E. D. Tetreau, in his study of Ohio farmers, points out that inheritance "Is of far more importance in the low-tenancy (Union) than in the high-tenancy county (Madison). In the former, 43 percent of the owners were aided by some form

TABLE 2.—ACQUISITION OF FARMS THROUGH INHERITANCE IN UNITED STATES

Location	Year Pub- lished	Type of study	Tenure	No. of farms in study	Importance of inheritance ¹
Five Mid-Western states ²	1919	Agricultural Ladder	Owners	2, 112	24% acquired first farm land through inheritance.
Kansas ³	1920	Agricultural Ladder	Owners	2, 533	11% acquired first farm land through inheritance.
Massachusetts ⁴	1923	Farm Ownership	Owners	588	25.4% acquired farms through inheritance.
Nebraska ⁵	1924	Landlords	Landlords	535	20% acquired land through inheritance.
Nebraska ⁶	1926	Agricultural Ladder	Owners	616	23.9% acquired land through inheritance.
United States ⁷	1926	Ownership of tenant farms	Landlords	23, 963	27% acquired farms in part through inheritance. 11% acquired farms wholly through inheritance.
Wisconsin ⁸	1928	Agricultural Ladder	Owners	2, 051	12.5% acquired all of farm land through inheritance.
South Carolina ⁹	1928	Land Prices and Ownership	Owners	170	26% acquired the farms through inheritance.
Ohio ¹⁰	1931	Agricultural Ladder	Owners	340	39% acquired all of farm land through inheritance. 39% acquired a part or all of farm land through inheritance.
Delaware ¹¹	1932	Farm Tenancy	{Landlords Owner- Operators	280 79	40.1% acquired all of farm land through inheritance. 13.7% acquired a part of farm land through inheritance.
Arkansas ¹²	1937	Plantation operations	Owners	89*	16.2% acquired all of farm land through inheritance. 25.4% acquired a part of farm land through inheritance.
Tennessee ¹³	1938	Inheritance	Owner- operators and tenants	457	42.5% of the total acreage acquired through inheritance. 44.4% had received some inheritance, either land or personal property which permitted the purchase of land or working capital for advancement in tenure status.
Kentucky ¹⁴	1944	Land Tenure	Owner- operators		More than 50% inherited all or a part of their farms.

Footnotes for table on page 945.

of inheritance, in the latter, only 34 percent."¹¹ The authors of a study in South Carolina noted, "There is evidence to indicate that the percentage of men who inherit farm land is less now (1928) than it was in the past; higher land values, increased population and smaller farms are some causes of this."¹² Several other studies have also reported a decline in the importance of inheritance. On the relation of owner-operators to previous owners and of tenants to landlords, a study of farm tenancy in central Illinois has the following to say. "Nearly two-thirds of the owner-operators were sons or sons-in-law of previous owners. Less than one-fourth of the tenants were sons or sons-in-law of their landlords, while nearly one-third of the farms classed as tenant farms were owned by fathers, mothers, or other near relatives of the tenant or his wife."¹³

¹¹ "The 'Agricultural Ladder' in the Careers of 610 Ohio Farmers," *The Journal of Land and Public Utility Economics*, Vol. VII, No. 3, August, 1931, p. 239.

¹² W. C. Jensen, and B. A. Russell, *Studies in Farm Land Prices and Ownership*, South Carolina Agricultural Experiment Station Bulletin No. 247, March, 1928, p. 34.

¹³ G. W. Kuhlman, "A Study of Tenancy in Central Illinois," *The Journal of Land and Public Utility Economics*, Vol. III, No. 3, August, 1927, p. 294.

(Explanation to notes for table 2 on facing page)

* Plantations.

¹ Includes "gifts."

² W. J. Spillman, "The Agricultural Ladder," *American Economic Review, Supplement*, March, 1919.

³ *Director's Report*, 1918-19, Kansas Agricultural Experiment Station, 1920, p. 11.

⁴ L. P. Jefferson, "A Study of Farm Ownership in Massachusetts," *Journal of Farm Economics*, Vol. V, No. 4, October 1923, Table IV, p. 217.

⁵ J. O. Rankin, *Landlords of Nebraska Farms*, Nebraska Agricultural Experiment Station Bul. No. 202, 1924, Table 2, p. 10.

⁶ J. O. Rankin, *Steps to Nebraska Farm Ownership*, Nebraska Agricultural Experiment Station Bul. No. 210, 1926, Table 9, p. 24.

⁷ H. A. Turner, *The Ownership of Tenant Farms in the United States*, United States Department of Agriculture Bul. No. 1432, 1926, Table 24, p. 40.

⁸ B. H. Hibbard, and G. A. Peterson, *How Wisconsin Farmers Become Farm Owners*, Wisconsin Agricultural Experiment Station Bul. No. 402, 1928, Table VII, p. 16.

⁹ W. C. Jensen, and B. A. Russell, *Studies of Farm Land Prices and Ownership*, South Carolina Agricultural Experiment Station Bul. No. 247, 1928, p. 37.

¹⁰ E. D. Tetreau, "The 'Agricultural Ladder' in the Careers of 610 Ohio Farmers," *The Journal of Land and Public Utility Economics*, Vol. VII, No. 3, August, 1931, Table II, p. 240.

¹¹ R. O. Bausman, *Farm Tenancy in Delaware*, Delaware Agricultural Experiment Station Bul. No. 178, 1932, pp. 62-3.

¹² H. W. Blalock, *Plantation Operations of Landlords and Tenants in Arkansas*, Arkansas Agricultural Experiment Station Bul. No. 339, Table 1, p. 8.

¹³ C. E. Allred, and E. E. Briner, *Inheritance as a Factor in the Progress of Tennessee Farmers*, Rural Research Series Monograph No. 88, Tennessee Agricultural Experiment Station, 1938, Table V, p. 7.

¹⁴ J. H. Bondurant, *Land Tenure in Southern Logan County, Kentucky*, Kentucky Agricultural Experiment Station Bul. No. 464, 1944, p. 22.

A study made in Tennessee warrants special mention.¹⁴ Rather than confining attention to the ownership of farm land, the acquisition of wealth through inheritance was shown to be a factor in the advancement of tenure status. Forty-eight percent of the wage workers who received an inheritance became tenants and 47 percent became owners. Only 3.1 percent of the wage workers had no change in status with receipt of their inheritance. Likewise, 72 percent of the tenants became owners and 70 percent of the owners purchased additional land at the time of their inheritance.¹⁵ The amount of inheritance in terms of dollars varied widely and was significant in determining the extent of change in land tenure status. "Those who received more than \$4,000 inheritance were either owners at the time of inheriting or became owners upon inheriting, except two farmers who had not yet found desirable farms to purchase, but who expected to purchase."¹⁶ However, the time of inheritance was also of great importance. "Sometimes a small amount, at a critical time in the farmer's career, may have more significance than a larger amount would have at another time."¹⁷

III

The laws of inheritance permit wide discretion on the part of property owners in the way they may dispose of their properties by will. The practices used depend upon the judgment of the testator and the degree of responsibility he assumes.¹⁸ Therefore, the approach to the solution of farm land inheritance problems lies in the education of property owners as to the functions of farm succession and in providing them with a better knowledge of the ways certain practices operate in violation of these functions.

The functions of inheritance are:

¹⁴ C. E. Allred and E. E. Briner, *Inheritance as a Factor in the Progress of Tennessee Farmers*, Rural Research Series Monograph No. 88, Tennessee Agricultural Experiment Station, 1938.

¹⁵ *Ibid.*, Table XIII, p. 16.

¹⁶ *Ibid.*, p. 13.

¹⁷ *Ibid.*, p. 1.

¹⁸ It might be assumed that intestate cases are also a part of the judgment of the property owners; that is, in their judgment the methods provided by the state laws for intestacy are adequate for their individual situations. It is possible to question the soundness of that judgment. Recent work in Virginia has brought out the fact that few farm owners who do not have a will know how the laws of descent will operate in their particular cases. They might judge that the law is adequate for their situation, but their judgment in many cases is based upon a misunderstanding of the law.

1. To provide for the security of the surviving wife or husband until her or his death.
2. To provide for equitable treatment of the children or other heirs.
3. To transfer ownership with a minimum of friction, confusion, and uncertainty in the process.
4. To provide an ownership pattern which does not result in the exploitation of the farm resources and inefficient use of the land.

The first two of the named functions are of primary importance. This is confirmed by the state laws of descent where dower and curtesy rights are one of the few limitations placed upon inheritance, and are but an expression of the thought of our lawmakers as to the importance of security for the surviving spouse in the inheritance process. Also, most wills and other farm-transfer arrangements provide for the security of the surviving spouse in some manner. The importance of the second function is also sanctioned by the laws of descent, in that they provide for equal division among children in intestate cases. However, the belief that equal division necessarily means equitable treatment must be guarded against.

Imperfections in the succession practices used by farmers are known to create problems which hinder the achievement of the purposes of inheritance as stated above.

First, the philosophy of distributing the property equally among the several heirs frequently results in a complete disintegration of the farm as a going concern. Where the land is actually divided, often the effect is to create several units too small for efficient use of resources or for full employment of the operator's labor. There is little doubt that the small farm problem in many parts of the United States has developed in part from equal subdivision among heirs in both testate and intestate inheritance.

Classic examples can be found upon a casual examination of the deed and will books of any county. This problem has been particularly prevalent in areas like the southern Appalachian highlands, where a high degree of economic isolation exists and where non-farm employment opportunities for the children are limited. Nor is it absent from our better farming regions. Professor Kuhlman, in a study of farm tenancy in central Illinois, says, "Many of these farms have been divided for purposes of inheritance until the individual holdings are not economic units."¹⁹ Doctor Gray has pointed

¹⁹ G. W. Kuhlman, *op. cit.*, page 294.

out the examples in Utah and eastern Idaho where "The land has been subdivided among the several heirs in such manner that there has developed in two generations a scattered small-field system somewhat comparable to that of Europe in the Middle Ages. This has come about largely as a consequence of the desire to distribute good and poor land equally among the heirs even though the holdings consist of six or eight parcels each separated by a mile or more."²⁰

Studies made in New Mexico have shown that this equal subdivision among heirs has resulted in long narrow boundaries which are costly to fence and inefficient to operate. In other regions, many odd-shaped farms have been created by men appointed to divide estates. Cases are known to exist where efforts to reconsolidate the original units has proved costly in time, labor, and capital.

The influence of the small farms upon soil conservation is of particular importance. Where the farm is small, the size of the acreage places a definite limitation upon the selection of crop land, and in many cases land unsuited for cropping has been brought into cultivation. This is especially important in the intensive one-crop areas, where soil conservation requires a shift to alternative enterprises, usually general or livestock farming. The small farms have proved a definite handicap in making the shift.

In many instances where farms are subdivided among several heirs, each share does not become an individual farm unit, as frequently one heir, usually a son, buys the shares of the other heirs. In these cases the farm land remains intact, but the buyer may be in a poor bargaining position with regard to the purchase price, due to sentimental attachments to the home place, disagreement among members of the family, or because the death occurred during a period of inflated prices of farm land. Where this occurs the intention of the testator to divide his estate equally among his heirs is violated. Furthermore, abnormally heavy mortgages may result from the endeavor to obtain funds needed to purchase the shares of the other heirs. This often leads to exploitative farming and a relatively low standard of living in order to meet the interest and principal payments.

It has been pointed out that equality rather than equitability guides our laws of descent. They are designed to meet the average

²⁰ L. C. Gray, et al., *op. cit.*, p. 117.

condition, and where individual situations vary from the average, the farm owner has full freedom to make adjustments through a will or other farm transfer arrangements. Frequently, one child has remained at home and has contributed materially to the maintenance of the farm during the declining years of his parents. In this way he also contributes to the welfare of the parents during their old age. Thus, equal division among heirs provides no compensation for these contributions, and it becomes necessary for the parents to stipulate in writing a more equitable division. With the increase of father-and-son partnerships in farming this particular situation attains great importance. Otherwise, the son who has remained on the farm and who had often spent time, labor, and capital toward building a high-producing herd of livestock and toward improving the farm land and buildings, will find his interest in the business unprotected at the death of his father.

Second, the time required in the settlement of estates creates a period during which the maintenance of the land and buildings and the proper utilization of the land are difficult to achieve. Often one or two years are required before court procedure permits the completion of a settlement, and cases are known in which a much longer period is required if minor heirs are involved. Under these circumstances, one of the heirs may take over the management of the farm, or if this is not possible, the farm may be rented to a tenant. In either case, the period of settlement may have adverse influences upon land use and farm management practices. Both the heir and the tenant are aware that their relationship to the farm will be significantly changed at the final settlement of the estate, and too often in such instances, there is an attitude of "drifting along" until the more permanent relationship is known.

Third, inheritance practices frequently give rise to a number of farm tenancy problems. Life estates devised to widows usually result in some form of tenancy under short-term leases during which time the maintenance of land and buildings is neglected. "A study of inheritance in three Iowa counties during a 10-year period indicates that approximately one-third of the testators bequeathed life estates in their acreages. The recipients of these life estates averaged 65 years of age. Since they often have little or no interest in the property except as a means of income during their lifetime, and since their average age is so advanced, the system of tenancy arising under such circumstances is often particularly

bad."²¹ Under other conditions life estates frequently result in exploitation of the land when the recipient endeavors to obtain the largest possible cash income during the life interest.

Farms passing under intestate inheritance, especially where minor heirs are involved, often result in tenant operation under very unstable conditions. Where court procedures are involved the degree of instability may be greatly increased. Inheritance may create tenancy when farms are devised to heirs who are not interested in farming. Under these cases, the devisee may elect to keep the farm as an investment or he may simply want to keep the home place in the family name. In a study made in Delaware, "about two-fifths of the farms owned by landlords in the areas studied were inherited outright, and inheritance played a part in the ownership of over one-half of them."²² Insofar as inheritance transfers farm land to landlords, it makes the attainment of ownership by farmers more difficult. This condition has an accumulative effect as the probability of the children of a landlord being interested in farming as a source of employment is less than with children of farm operators. On the other hand, there is the probability that an owner-operator might acquire the land in the settlement of the landlord's estate, particularly if two or more heirs are involved.

Fourth, there is a tendency for inheritance to transfer wealth from rural to urban ownership and from rural to urban communities. This drain upon rural wealth is a result of the large net migration of farm youth to the cities. Whenever one heir remains on the farm and buys the shares of the other heirs who have moved to the city, wealth moves from an agricultural region to an urban community. Analysis of 406 farm estates in Franklin and Madison Counties, Ohio, 1919-32, showed that approximately 20 percent of the total net valuation of the estates passed to heirs who lived in cities.²³ It is doubtful that the inheritance of urban wealth by rural heirs is sufficient to offset this flow of wealth. However, this wealth migration is not peculiar to our inheritance system as it takes place when farms are sold and the farmer moves to town, or, as is often the case, when he retires to town on his capital accumulation.

²¹ L. C. Gray, et al., *op. cit.*, page 118.

²² R. O. Bausman, *Farm Tenancy in Delaware*, Delaware Agricultural Experiment Station Bulletin No. 178, 1932, p. 62.

²³ E. D. Tetreau, *Migration of Agricultural Wealth by Inheritance*, Mimeograph Bulletin No. 65, Department of Rural Economics, Ohio State University and Ohio Agricultural Experiment Station, 1933.

IV

The best methods of inheritance and transfer of farm property from one generation to the next are not known. Some ways have been mentioned in which inheritance practices have contributed materially to land problems. Yet their full effect is still unknown. More knowledge is needed as to the extent of land transferred through inheritance, the amount of land held in life estates, undivided estates and unsettled estates, the manner of the uncertainties and confusion which arise from the inheritance process, the instability created in the land tenure system, the destruction of the farm as a going concern, and the effect upon conservation of land resources. It is known that in some families the transfer of family property is handled more effectively than in others. A good approach would be to study the practices used by these families in comparison to those used by other families where problems have arisen. With the knowledge that can be gained as to what constitutes successful and unsuccessful practices, we shall be better equipped to advise farmers regarding the distribution of their property to their heirs.

NOTES

WHY FARMERS DISTRUST LABOR UNIONS

OUR producer economy is today engaged in an attempt to solve its most fundamental problem. The problem: How to reconcile the opposed interests of the various producer groups. If the problem is not solved, the economy bids fair to perish from internecine warfare if not from attacks from without.

Whether or not the reconciliation of interests can be achieved without de-emphasizing producer interests is for the moment immaterial. Enough only to say that the effort is laudable, and if made intelligently can have nothing less than some degree of beneficial result.

One field in which the conflict of opposing interests—real or fancied—is most bitter is the field relationships between farmer and urban laborer. Because these two groups are separated by the distributors of their respective products, they have little opportunity to meet and talk over their differences; and to discover that their differences are not so real and clear-cut as they appear from a distance. Rural-urban conferences are becoming more popular in their efforts to educate workers, farmers, and professional people to better understanding of the problems, aims and methods of their producer opposites. But they are sorely limited in coverage as yet; They reach all too few of those concerned.

Educators in the field of agriculture are increasingly aware of the necessity for some understanding of the problems of urban laborers by farmers and farm leaders. The objective of this article is to attempt an explanation—not a solution—of some of the beliefs current among many farmers and farm leaders regarding laborers, and especially labor unions. While it is manifestly impossible to present a conclusive analysis in so short a paper, it is hoped that a few basic factors may be mentioned which will throw some light on the development of the present-day farmer attitude towards urban laborers.

Although farmer animosity toward labor unions fluctuates in intensity—reaching peaks in periods such as the early 20's, the mid 30's, and today, the fundamental causes remain at all times. They are the factors which must be brought to light and examined. A list of all these factors would be long. But inasmuch as many of

them are outgrowths of other causes they may be omitted as secondary. Primarily, the basic factors can be given as follows:

The farmer's deep-rooted belief in the institution of private property.

The influx of immigrants from the south of Europe during the late 1800's and early 1900's.

The continuing union drive for a shorter work week.

Strikes, radical labor leaders, and bad publicity.

It is not the intention of this paper either to condone or condemn. A discussion of the factors listed, their growth and their results and interpretations is the sole purpose.

First, and probably most basic of all forces involved in farmer attitudes towards urban laborers is the farmer's belief in private property. Tenant farmers are no exception to this. Even though some of them may actually prefer tenancy to the risks of ownership, they nonetheless will defend to the hilt their right to private property.

Do urban laborers oppose the institution of private property? Emphatically no! Then why or how can it be a factor? The answer to that involves a brief historical review including an interesting sidelight on how propaganda, together with apparently opposing interests, can misdirect the thinking of individuals and groups. "Misdirect" is used here in the sense of directing individuals or groups to believe things which are not true of certain other individuals or groups.

The opportunity to obtain free land and to acquire private property was probably the most important factor in retarding the growth of unionism in the United States during the 1800's.¹ It was only after the Pacific Ocean was reached and the lands between it and the Mississippi were settled that the unions began to have strong popular appeal. Millis and Montgomery list this as a dominant factor in the relative lack of class consciousness on the part of the American worker until that time.²

As free land became more scarce, as large industrial corporations developed, the difficulties in entering the entrepreneurial class rapidly increased. The American worker gradually and reluctantly accepted the fact that he would remain a hired worker all his life.

¹ Millis and Montgomery, *Organized Labor*, McGraw-Hill Book Co., New York, 1945, p. 13.

² *Op. cit.*

He began to develop a more acute class consciousness—aided by intellectuals in the labor movement.

This does not mean that the American workman was losing his belief in private property. Far from it; the traditional dream of the urban laborer—to earn some money, acquire a bank account, and then retire to a little chicken farm is active proof of this fact. The laborer may have been forced to abandon his desire and hope of becoming a farmer during his producing life, but he could and did maintain his dream of a bucolic old age.

Further evidence of the desire of the American worker to rise out of his class was his fanatic espousal of producer cooperatives, of land reforms, the Free Silver movement, Henry George's single tax plan, and the ideological, reformist Knights of Labor. For these movements, if they did not offer free land to every man at least promised more equitable distribution of property and the means of production.

What has been termed "the paradox of farmer-laborer relations" is the historical fact of farmer-laborer agreement on political issues simultaneously with opposition on economic grounds.

Farmers allied themselves with labor groups in backing many of the land reform schemes, taxation and monetary programs of the 19th century. They agreed largely in their approval of Theodore Roosevelt's trustbusting, with Woodrow Wilson's New Freedoms, with the progressive income tax, with the Federal Reserve program, even with much of the New Deal philosophy.

But any fraternity that farmers as a group felt for labor unions was greatly dispersed with the decadence in the 1890's of the Knights of Labor, and with the emergence of the "pure and simple unionism" of Samuel Gompers' American Federation of Labor. Pure and simple unionism was based on the idea that wage earners were a separate class in a producer economy. They must stick together, avoid politics, and limit their activities to the immediate economic problems of wages, working conditions, and hours of labor. Labor became for all practical purposes a producer group interested only in getting as much as it could of the national pie.

As such the AFL prospered mightily, numerically. And during the first world war, which it supported patriotically, it gained many concessions from the government. Then the war was over, and the labor-management fight was resumed. Business was more shrewd this time, however, and used more subtle and effective

methods. Calling it the "American Plan," and using the yellow dog contract and the blacklist as basic weapons, management simultaneously disarmed their employees by encouraging company-sponsored unions. They set up personnel departments as evidence of their sometimes sincere interest in the workers.

During this same period the nation was undergoing a "red" scare of major proportions. Management wisely capitalized on the situation. Quoting Millis and Montgomery:

Powerfully favoring the "American Plan," also, were the post-war anti-'red' hysteria, which for a time furnished to millions of middleclass people, a psychological outlet for the hysteria and emotionalism engendered during the war, and which could easily be turned against labor organizations and their leaders, and the success of the appeal to the farmers' organizations that they make common cause with the employers against the monopolistic closed shop."³

It was of course a simple and natural thing for the farmer to accept these charges against unionism. Strikes and riots in the cities, and occasional massacres in the coal fields served to revitalize his suspicions at frequent intervals. It was immaterial who was at fault. Where there's smoke, there's fire, and even in those cases where management was the offender, it must have had plenty of reason. How can you deal with foreigners and communists? The IWW was nearly finished, but it had left its legacy of hate and fear.

Attributing to all laborers and their unions the radical, revolutionary objectives of isolated bomb throwers and the lawless IWW was normal, aided and abetted as it was by certain segments of management, and by the loud and emotional press.

The farmer was afraid for his property. If the unions took over the factories, the next step, taking over the farms, would be a simple matter. So, although the laborer believed in private property, and did not want to own the factories, the farmer had no way of knowing this. To him, industrial democracy meant worker ownership and control of the factories, first step to socialization of the nation.

Perlman recognized this situation in the late 20's when he said:

A Bolshevik *coup d'état* in America would mean a civil war to the bitter end, and a war in which the numerous class of farmers would join the capitalists in the defense of the institution of private property⁴

³ *Op. cit.*, p. 167.

⁴ Selig Perlman, *Trade Unionism in the United States*, p. 302.

Perlman also recognized the American unionist's bent to conservatism in a further statement.

... American trade unionism ... seems in a fair way to continue its conservative function—so long as no overpowering open-shop movement or 'trustification' will break up the trade unions or render them sterile.⁵

Thus, the farmer's belief in private property became a major force in his dislike for labor unions as he thought he saw certain proof of labor intent to socialize the nation and destroy the institution of private property.

Mentioned earlier, the influx of immigrants from south Europe was a factor in developing suspicion of laborers among the farm population. At least three important phenomena were associated with this immigration and its effects.

One: managerial and political opportunities were largely barred to the immigrants. Yet there were among them intellectuals and men of ability. Their genius had to have an outlet, and so they engaged in labor union activities. Theirs was the social reform program designed to give the worker a voice in his business, to obtain for him political and social rights as a class. This was in contrast to the early American Knights of Labor brand of unionism which sought to lift the worker out of his worker class and also was opposed to the producer unionism of Samuel Gompers' AFL. To ally all unionism with the Socialist-minded unionism of the immigrant intellectual was a simple procedure in the American middle-class mentality.

A second point: the influx of the immigrants, even without the intellectuals, was important. Farmers traditionally suspected foreigners. Anything might be expected of the uneducated, clan-nish Italians, Greeks, Slavs. And this attitude was fostered by the "native" American workers, immigrants or sons of immigrants from north Europe, which brings up the third point.

Oftentimes the immigrants were used as strike breakers and union breakers by management. They were unskilled, but new types of machines were introduced which the immigrants soon mastered, and which could displace many skilled workmen. So the unions, largely trades organizations, developed closed shops to bar the immigrants from the jobs. And farmers voted with laborers for the imposition of immigration restrictions.

The continued union drive for a shorter work day and work week

⁵ *Ibid.*, pp. 305-6.

is another factor making for misunderstanding. To the farmer who talks of his own ten, twelve, and fourteen-hour workday—and who sometimes does work that long—the forty-hour week and the eight-hour day are hard to justify.

To the laborer who demands this work schedule, it is a simple and reasonable request. When work is plentiful, he is not so insistent on the forty-hour week. There is no need to worry when all have jobs, but when work is scarce, he believes, somewhat mistakenly it is true, that shorter work weeks mean jobs for more men, pay-checks, even though small, for everybody. Having a job to work at is very important to the worker. It is a matter of self-respect. The farmer who has reluctantly accepted relief goods in depression times can understand this. He lacks, however, the experience of having nothing to do. There is always work on a farm, even if it doesn't return an income. It is the fear of unemployment which is partly responsible for shorter hours agitation, and mainly responsible for "feather-bedding," for slowdowns and make-work practices, for jurisdictional strikes and other seemingly anti-social labor activities.

A second factor in short hour drives is the steady pace at which many laborers work, the extremely monotonous and tensioned strain of supervised effort. Eight hours of constant attendance on a machine or assembly line, or on a surprisingly competitive construction job (where a carpenter or bricklayer can not be fired, but always can be "laid off") is very fatiguing. Many farm boys and men who worked on war defense jobs can testify to this.

Consideration of the urban laborer's working hours must also take into account the additional time spent in commuting, which may run from one to three or four hours daily.

Evidence that shorter hours have been an important consideration in forming farm attitudes is the statement from the 1919 and 1920 convention of the American Farm Bureau Federation:

... a large factor in the high cost of living is the curtailment of production through short hours, lessened efficiency of labor and strikes.⁶

Strikes have been and continue to be red flags before the farmer's eyes despite the relatively infinitesimal time actually lost through strikes. All the time lost from strikes during the war, for example, did not amount to the time put in on national holidays by the shipyard workers alone. Some strikes, they admit are justified but

⁶ Minutes of American Farm Bureau Federation Convention, 1919 and 1920.

most of them are not. The American Farm Bureau Federation in its 1946 convention agreed upon "... the privilege to strike by employees . . ." with provisions.⁷ Without going into the justification or unjustification of any strike policies, it is sufficient to say that strikes leave a bad impression on the public. Unionists recognize this fact; so do the newspapers which play them up so consistently.

Bad publicity, in fact, has often been as important item. Newspapers and magazines live on the sensational. They are largely the property of management, and naturally speak for management. Unions have been slow to learn public relations and have often done a better job than their opposition in placing themselves in unfavorable positions.

Lastly, radical or dictatorial labor leaders have caused much anti-labor feeling. Whether or not they have been in the right in given instances, their actions and speeches have been oftentimes ill-advised. Education of the farmer on labor unions must take account of this latter fact.

The foregoing discussion has presented some of the reasons why farmers feel as they do about laborers and labor unions. The reasons are understandable and not to the discredit of the farmers. But the necessity of educating the farmer to a more understanding view of his city brother is obvious. (Laborers have distorted pictures of farmers too, of course, the main theme of which is doubtless envy.)

That many farm groups and farm leaders are endeavoring to evaluate labor unions objectively is more than evidenced by a 1945 issue of the CIO *Economic Outlook* bulletin which cites The National Farmers Union, "... many state and county officials . . ." of the American Farm Bureau, "... sections of the National Grange," and various "farm state congressmen" as "fearless friends of labor."⁸ From such a naturally biased source, one can assume that there are indeed many farm leaders who are trying to promote better laborer-farmer understanding.

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⁷ American Farm Bureau Federation, *Resolutions*, 28th annual convention, San Francisco, California, December 12, 1946, p. 11.

⁸ *Economic Outlook*, Congress of Industrial Organization, 718 Jackson Place, N.W., Washington 6, D. C., September 1945, p. 8.

ESTIMATING THE VALUE OF CITRUS FRUIT AS IT DEVELOPS¹

CITRUS groves increase in value as they increase in age and productiveness. Citrus fruit also increases in value as it develops. This study is an attempt at a method of approximating fruit value by months from the bloom to mature fruit. Such information is often very valuable in appraisals for the settlement of estates, setting fruit values upon sale of grove, and for other purposes.

This method is based upon the average cost of labor and materials by months for the seasons of 1940-41 and 1944-45, and it is assumed that the monthly increases in fruit value are in direct proportion to this cost. The former season was selected as it represents conditions prior to the recent war, while the latter is the most recently completed season of the citrus cost of production work of the Florida Agricultural Extension Service. It was thought that the 2 seasons selected would be a better basis for this purpose than the 2 most recent seasons. The 1940-41 season represents 221 groves over 10 years of age containing 7685 acres, and the 1944-45 season represents 160 groves containing 5474 acres.

The per-acre value of the fruit at maturity is determined by the marketable production and price per box. In arriving at the estimated value of maturing fruit, it is necessary to estimate the production and the on-tree price of the fruit as of its maturity. This is quite difficult during the early months of the season but very often the circumstances making such values desirable do not arise until several months have elapsed. In such cases the time for making the estimate is nearer the time of fruit maturity and, thus adds to the accuracy.

Little is discernible concerning the amount of bloom prior to the opening of the flowers; hence, March is here taken as being the first month for which an estimate might be made of the quantity of blooms as an indication of what might be expected in the way of a fruit crop. Since all kinds and varieties of citrus bloom at approximately the same time, March is used as the first month for beginning estimates of fruit values for oranges, grapefruit, and tangerines.

¹ The writer is indebted to Dr. C. V. Noble and Dr. M. A. Brooker, Department of Agricultural Economics, University of Florida, who read the manuscript and made helpful suggestions.

The time required for fruit to mature varies with the kind and variety of citrus. For example, Parson Brown oranges mature earlier than Valencia oranges. For this work the time to maturity is considered according to kind and maturity season, as follows:

	Month Attains Maturity or Full Value	Number of Months in Maturing
Early oranges	October	8
Midseason oranges	December	10
Late oranges	February	12
Temples	December	10
Tangerines	December	10
Grapefruit	November	9
Mixed kinds and varieties	December	10

Late oranges constitute the only group extending through the entire year. Consequently, the value distribution is the same as the input distribution for the year. All other groups extend 10 months or less. The value distribution for these groups is the same as the input distribution for the months involved, although the expenses of the months not included in the maturity period are in effect distributed over the period involved in proportion to the input of the months of that period. For example, the total expenses for the months of November, December, January, and February for early oranges are in effect distributed over the fruit-maturing period of 8 months in proportion to the expenses of each month from March through October (Table 1).

TABLE 1. CUMULATIVE PERCENTAGE DISTRIBUTION OF THE VALUE OF MATURING FRUIT BY MONTHS AND KINDS OF CITRUS

Month	Early Oranges	Midseason Oranges, Temples, Tangerines, Mixed Grove	Late Oranges	Grapefruit
March	9.7	8.0	6.7	8.6
April	21.5	17.7	14.8	19.1
May	38.8	31.9	26.7	34.5
June	66.0	54.2	45.4	58.6
July	75.0	61.6	51.6	66.6
August	85.8	70.5	59.0	76.2
September	92.2	75.8	63.4	81.9
October	100.0	82.3	68.8	88.9
November		92.6	77.4	100.0
December		100.0	83.6	
January			94.1	
February			100.0	

After estimating the production and price of the fruit the estimated value of fruit is obtained as of the time of its maturity. The attained fruit value as of any particular month is obtained by applying the cumulative percentage figure for the month desired to the estimated value of fruit at the end of the season. For example, the estimated value of Hamlin oranges (an early variety) in August would be 85.8 percent of their value at maturity.

Table 2 is an example of estimating the values of the fruit on a 25.7 acre grove containing different kinds of citrus as of the month of July by using Table 1. This method necessitates percentage calculations for each kind of citrus.

TABLE 2. APPROXIMATE CITRUS FRUIT VALUES IN JULY ON A 25.7 ACRE GROVE BY CALCULATIONS FROM TABLE 1

Kind	Variety	Acre- age	Esti- mated Yield in Boxes per Acre at Maturity	Estimated Price per Box at Maturity	Esti- mated Fruit Value per Acre at Ma- turity (2) × (3)	July Percentage of Ma- turity Value Table 1	July Value of Fruit per Acre (4) × (5)	Total Value (1) × (6)
		(1)	(2)	(3)	(4)	(5)	(6)	
Oranges								
Early	Parson Brown	8.1	330	\$1.90	\$627	75.0	\$470	\$3,807
Midseason	Pineapple	3.1	450	2.20	990	61.6	610	1,891
Late	Valencia	11.4	360	2.70	972	51.6	502	5,723
Grapefruit	Duncan	1.8	420	2.25	945	66.6	629	1,132
Tangerine	Dancy	1.3	440	2.00	880	61.6	542	705
Total		25.7						13,258

Approximate figures are obtained by using estimated production and price with Table 1, as illustrated in Table 2. Since these 2 estimates are necessary, a table of values (Table 3) is given which will facilitate arriving at values sufficiently close to the values obtained by use of Table 1 to make Table 3 useful in most cases. After arriving at the estimated value of fruit per acre at maturity, each monthly value may be read from the table by using the column headed by the figure nearest in value to that estimated. For example, if it is estimated that the yield will be 350 boxes per acre for grapefruit and that the price will be 80 cents, the value would be \$280 per acre at maturity. The nearest figure to this which heads a column in Table 3 is \$275. The value for any month could immediately be read from the table, which value would be near enough since both production and price figures are estimates. The greatest difference between the 2 sets of figures in the example

would be \$5 at the time of fruit maturity and for all other months the spread would be less.

In any case, the greatest spread for any variety between the figures in Table 3 and those arrived at by the use of Table 1 would

TABLE 3. VALUE OF FRUIT IN DOLLARS PER ACRE BY MONTHS FROM BLOOM TO MATURITY*

Value at Maturity	600	625	650	675	700	725	750	775	800	825	850	875	900	925	950	975	1000
Early Oranges																	
Mar.	58	61	63	65	68	70	73	75	78	80	82	85	87	90	92	95	97
Apr.	129	134	140	145	150	156	161	167	172	177	183	188	194	199	204	210	215
May	233	242	252	262	272	281	291	301	310	320	330	340	349	359	369	378	388
June	396	412	429	446	462	478	495	512	528	544	561	578	594	610	627	644	660
July	450	469	488	506	525	544	562	581	600	619	638	656	675	694	712	731	750
Aug.	515	536	558	579	601	622	644	665	686	708	729	751	772	794	815	837	858
Sept.	553	576	599	622	645	668	692	715	738	761	784	807	830	853	876	899	922
Oct.	600	625	650	675	700	725	750	775	800	825	850	875	900	925	950	975	1000
Midseason Oranges, Temples, Tangerines, and Mixed Groves																	
Mar.	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80
Apr.	106	111	115	119	124	128	133	137	142	146	150	155	159	164	168	173	177
May	191	199	207	215	223	231	239	247	255	263	271	279	287	295	303	311	319
June	325	339	352	366	379	393	406	420	434	447	461	474	488	501	515	528	542
July	370	385	400	416	431	447	462	477	493	508	524	539	554	570	585	601	616
Aug.	423	441	458	476	494	511	529	546	564	582	599	617	634	652	670	687	705
Sept.	455	474	493	512	531	550	568	587	606	625	644	663	682	701	720	739	758
Oct.	494	514	535	556	576	597	617	638	658	679	700	720	741	761	782	802	823
Nov.	556	579	602	625	648	671	694	718	741	764	787	810	833	857	880	903	926
Dec.	600	625	650	675	700	725	750	775	800	825	850	875	900	925	950	975	1000
Late Oranges																	
Mar.	40	42	44	45	47	49	50	52	54	55	57	59	60	62	64	65	67
Apr.	89	92	96	100	104	107	111	115	118	122	126	130	133	137	141	144	148
May	160	167	174	180	187	194	200	207	214	220	227	234	240	247	254	260	267
June	272	284	295	306	318	329	340	352	363	375	386	397	409	420	431	443	454
July	310	322	335	348	361	374	387	400	413	426	439	452	464	477	490	503	516
Aug.	354	369	384	398	413	428	442	457	472	487	502	516	531	546	560	575	590
Sept.	380	396	412	428	444	460	476	491	507	523	539	555	571	586	602	618	634
Oct.	413	430	447	464	482	499	516	533	550	568	585	602	619	636	654	671	688
Nov.	464	484	503	522	542	561	580	600	619	639	658	677	697	716	735	755	774
Dec.	502	522	543	564	585	606	627	648	669	690	711	732	752	773	794	815	836
Jan.	565	588	612	635	659	682	706	729	753	776	800	823	847	870	894	917	941
Feb.	600	625	650	675	700	725	750	775	800	825	850	875	900	925	950	975	1000
Grapefruit																	
Mar.	52	54	56	58	60	62	64	67	69	71	73	75	77	80	82	84	86
Apr.	115	119	124	129	134	138	143	148	153	158	162	167	172	177	181	186	191
May	207	216	224	233	242	250	259	267	276	285	293	302	310	319	328	336	345
June	352	366	381	396	410	425	440	454	469	483	498	513	527	542	557	571	586
July	400	416	433	450	466	483	500	516	533	549	566	583	599	616	633	649	666
Aug.	457	476	495	514	533	552	572	591	610	629	648	667	686	705	724	743	762
Sept.	491	512	532	553	573	594	614	635	655	676	696	717	737	758	779	799	819
Oct.	533	556	578	600	622	645	667	689	711	733	756	778	800	822	845	867	889
Nov.	600	625	650	675	700	725	750	775	800	825	850	875	900	925	950	975	1000

* To conserve space only a portion of Table 3 is here shown. The entire table includes monthly values by kinds of citrus for fruit values per acre at maturity at \$25 intervals from \$25 to \$1000.

be \$12.50 per acre and that would occur in the month of fruit maturity. The spread in the 2 values for months prior to maturity would be less than \$12.50 per acre with value differences least for the month of March.

Table 4 is an example of estimating the value of the fruit on the same 25.7 acre grove as of the month of July by using Table 3. Since

this method involves the substitution of the figure found in Table 3 that is nearest in value to the figure obtained by multiplying the estimated yield by the estimated price, slightly different results will be obtained. The estimated value of all fruit of this grove by the 2 methods differs only \$25. This small difference in estimated fruit value is offset by the time saved in calculation by using the second method.

TABLE 4. APPROXIMATE CITRUS FRUIT VALUES IN JULY ON A 25.7 ACRE GROVE BY READINGS FROM TABLE 3

Kind	Variety	Acre- age	Estimated Yield in Boxes per Acre at Maturity	Estimated Price per Box at Maturity	Estimated Fruit Value per Acre at Maturity (2) × (3)	July Reading from Table 3 in Column Headed by Number Nearest in Value to Maturity Value (4)	Total Value (1) × (5)
		(1)	(2)	(3)	(4)	(5)	
Oranges							
Early	Parson Brown	8.1	330	\$1.00	\$627	\$469	\$3,799
Midseason	Pineapple	3.1	450	2.20	990	616	1,910
Late	Valencia	11.4	360	2.70	972	503	5,734
Grapefruit	Duncan	1.8	420	2.25	945	633	1,139
Tangerine	Dancy	1.3	440	2.00	880	539	701
Total		25.7					13,283

Table 5 is an example of a third method of estimating the value of the fruit for the same 25.7 acre grove. This method involves interpolating figures from Table 3 for more accuracy than the second method given. The first and third methods require about the same time for computation and arrive at approximately the same results; the results would be identical if the calculations were carried to the penny instead of to the nearest dollar. Both are more exact than the second method, but the second method is sufficiently accurate and time saving to merit rather universal use. In the event the second method is not desired, the deciding factor between the first and third methods would be the personal preference of the appraiser.

After deciding which one of the 3 methods is preferred, a printed or processed form should be obtained to expedite fruit value appraisal computations. This form should be similar in outline to the headings of columns in the table illustrating the method preferred (Tables 2, 4, or 5).

In the event of an off-season bloom in sufficient quantity to

TABLE 5. APPROXIMATE CITRUS FRUIT VALUES IN JULY ON A 25.7 ACRE GROVE BY USE OF AND INTERPOLATION FROM TABLE 3

Kind	Variety	Acreage	Estimated Yield in Boxes per Acre at Maturity	Estimated Price Per Box at Maturity	Estimated Value per Acre at Maturity (2) × (3)	July Reading From Table 3 in Column Headed by Number Nearest to but Less Than Maturity Value (4)	Adjustment for Difference in July Table Reading (5) and July Value of Maturity Figure (4)*	July Value of Maturity Figure (6)	Total Value (1) × (7)
Oranges									
Early	Parson Brown	8.1	330	\$1.90	\$627	\$469	\$ 2	\$471	\$3,815
Midseason	Pineapple	3.1	450	2.20	990	601	9	610	1,891
Late	Valencia	11.4	360	2.70	972	490	11	501	5,711
Grapefruit	Duncan	4.20	420	2.25	945	616	14	630	1,134
Tangerine	Dancy	1.3	440	2.00	880	539	3	542	705
Total		25.7							13,256

* Table 3 is made up from maturity value figures at \$25 intervals. The adjustment formula for monthly values is:

$$\text{Adjustment} = \frac{\left[\left(\begin{array}{c} \text{Reading for month desired} \\ \text{from column headed by} \\ \text{figure nearest to but greater} \\ \text{than maturity value} \end{array} \right) - \left(\begin{array}{c} \text{Reading for month desired} \\ \text{from column headed by} \\ \text{figure nearest to but less} \\ \text{than maturity value} \end{array} \right) \right] \left[\left(\begin{array}{c} \text{Estimated} \\ \text{Maturity} \\ \text{Value} \end{array} \right) - \left(\begin{array}{c} \text{Column heading in} \\ \text{Table 3 that is near-} \\ \text{est to but less than} \\ \text{maturity value} \end{array} \right) \right]}{\text{Interval between maturity value figures in Table 3, or 25}}$$

Using this formula in the case of Parson Brown oranges for the month of July as an example:

$$\text{Adjustment} = \frac{(488 - 469) (627 - 625)}{25}, \text{ or } \frac{19 \times 2}{25}, \text{ or } 2.$$

increase materially the fruit production, a cumulative percentage distribution of the value of fruit could be formulated from the data given in Table 6.

TABLE 6. PERCENTAGE DISTRIBUTION BY MONTHS OF AVERAGE VALUE OF INPUT, 1940-41 AND 1944-45 SEASONS

Month	Percent
March	6.7
April	8.1
May	11.9
June	18.7
July	6.2
August	7.4
September	4.4
October	5.4
November	8.6
December	6.2
January	10.5
February	5.9
	100.0

TABLE 7. ADJUSTING MONTHLY PERCENTAGE POINTS TO ARRIVE AT CUMULATIVE PERCENTAGE DISTRIBUTION OF THE VALUE OF MATURING FRUIT BY MONTHS FOR LATE JUNE OR JULY BLOOM WITH FRUIT RIPENING IN APRIL

Month	Percentage Points	Adjusting Column (1) to Total 100	Cumulative Percentage Distribution
	(1)	(2)	(3)
July	6.2	8.9	8.9
August	7.4	10.7	19.6
September	4.4	6.3	25.9
October	5.4	7.8	33.7
November	8.6	12.4	46.1
December	6.2	8.9	55.0
January	10.5	15.1	70.1
February	5.9	8.5	78.6
March	6.7	9.7	88.3
April	8.1	11.7	100.0
Total	69.4	100.0	

A late June or July bloom, as is often the case, would mean that July would be the first month on which to place an estimate for this fruit. In the event such a bloom was of a kind and variety that the fruit would reach maturity the following April, the months to be considered would be July through April. The total of the per-

centage points for these 10 months is 69.4 (see Tables 6 and 7). To facilitate calculations these percentage points should be adjusted to total 100 by increasing each monthly figure the same percentage (Table 7).

In calculating the value of this fruit from a late June or July bloom the cumulative percentage figure in Column 3, Table 7, would be used in like manner as similar figures for the regular bloom as shown in Table 1. However, it would be necessary to calculate the fruit value by the method shown in Table 2. Figures from Table 3 could not be used for fruit from an off-season bloom.

In the event of a bloom that occurred at a time other than the 2 mentioned—regular and late June or July—a cumulative percentage distribution of value could be formulated from the figures given in Table 6 in like manner as the example shown in Table 7. Also, figures for a late June or July bloom that had a different length of maturity period than that shown in Table 7 could be derived similarly. With a crop of fruit set from a regular bloom and another crop set from an off-season bloom on the trees at the time of the appraisal, the 2 crops would be calculated separately and the sum of their values would be the estimate desired.

When 2 crops of fruit set from 2 regular blooms are on the trees at the same time, as often is the case of Valencia oranges, each crop would be calculated separately. The value of the crop of mature fruit would be obtained by multiplying the estimated yield by the going price or recent price offer. The value of the immature crop would be calculated as if no mature fruit were on the trees at the time of the appraisal. The sum of the values of the 2 crops would be the estimate for all fruit on the trees.

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AN EVALUATION OF "EVALUATING SOIL CONSERVATION"¹

IN THE article under consideration, Weitzell presents a criticism of previous methods of measuring the economic value of soil conservation, and proposes the "experimental method" as a desirable alternative. The objections to the "historical," the "budget,"

¹ E. C. Weitzell, this JOURNAL, Vol. XXIX, No. 2, May 1947, pp. 475-494.

and the "merit point" methods are generally valid, but the experimental method offers little relief from these same objections. One point on which there is complete agreement is that a workable approach to economic evaluation of conservation is sorely needed and is lacking at the present time. An analysis of these points will be made later but, first, some consideration of the approach to soil conservation evaluation via "soil conservation *per se*" is in order. Mr. Weitzell apparently uses the term "conservation" to denote those practices designed to prevent or reduce soil and water losses and plant nutrient leaching but omits the other aspects of soil depletion.

Any approach to conservation evaluation via the *per se* route presents a number of limitations. (a) This procedure entails the arbitrary selection of practices which are to be considered as the primary components of soil conservation. (b) It limits the investigation to the "wasting" of soil, water, and plant nutrients. (c) It mandates the selection of practices on the basis of *purpose in application*. (d) It separates soil conservation from farm organization and management. Presumably, those practices which are a part of the *farming system* in a particular area would not be soil conservation practices unless they were applied specifically for the reduction of soil, water, or nutrient losses.² It seems that in most cases the practice *per se*, in the light of its contribution to productivity maintenance, should be the criterion for assigning conservation merit rather than the *intended purpose* of the practice. (e) The conservation *per se* approach makes recourse to the accepted economic philosophy of conservation more difficult.

In selecting a definition of conservation for use in economic analysis, it is desirable to eliminate the arbitrary selection of components. Bunce³ uses the physical concept of conservation, exploitation, and improvement in conjunction with their economic parallels, maintenance, disinvestment, and investment. Under this definition, any input factor which contributes to the *maintenance* of soil resources is a conservation practice. Since in so many instances practices which are designed to prevent soil depletion (use of replaceable nutrients by crops) are also erosion preventives, it is often impossible or impractical to separate them. In fact, a treatment of con-

² Weitzell, op. cit., p. 476.

³ Arthur C. Bunce, *Economics of Soil Conservation*, The Iowa State College Press, Ames, Iowa. 1942, p. 10.

servation *per se* leads to the elimination of variables incapable of isolation. However valid the experimental method may be, its use may grant error in favor of explicitness. Even controlled experiments defy the isolation of benefits accruing to inputs designed to prevent or reduce "soil and water losses." From the standpoint of the individual, all conservation inputs are intended to enhance income on landed capital. Whether these inputs are intended for immediate effect or a flow of benefits is unimportant except as the time element and the rate of return on investment are important. Treatment of conservation as an attempt to maintain a particular level of physical productivity has considerable merit. In such treatment, all the contributing factors are considered. The elimination of related variables through controlled experiment does not erase the effect of those variables. *It merely postpones consideration until such time as projection to the universe is made.* In the projection of experimental results to specific areas (especially to broad areas) the difficulty of measurement may be transformed to difficulty of application.

The experimental method actually is a means of gathering data for conservation budgeting or of expanding or facilitating conservation budgeting or of expanding or facilitating conservation planning. It is undoubtedly a useful tool for demonstrating the potentiality of conservation practices. It is, however, much less valuable as a means of evaluating the economic benefits for broad areas. Case studies made under varying physical and economic conditions have fewer limitations. At least, the case method provides escape from the error which may be encountered by projecting experimental results to variable cases. Case studies reflect actual field conditions. Experimental results are useful guides, but their application to field conditions has resulted in invalid conclusions.

A number of questions may be raised in connection with the experimental method. (a) How is the effect of technology and the state of the arts to be measured? This method would make necessary a multitude of experiments with the various practices and combinations of practices under various stages of technological development if the effect of a changing state of the arts is to be measured. The effect of changing mechanization upon yields must be measured. The effects of timeliness of operation and advancements in plant and animal breeding must be measured. Separate experiments must be made for each combination of physical resources and

applied to varying economic conditions. (b) How is a monetary value to be placed upon labor and management? Charges for these factors would have to be varied according to varying conditions within rather narrow local areas. (c) What is the ratio of efficiency on the experimental plot to efficiency in the field? Errors in these considerations will multiply the error in total benefits unless the results are applied to small local areas. (d) Soil associations, soil types, and "land use capability classes" are not adequate criteria for applying results. Variation within these groups defies unit application. Application to homogeneous land class areas might be possible if detailed land class maps were available. (e) There is no basis for assuming that the difficulty usually encountered in applying controlled experiments to economic problems would not be encountered in the conservation problem. (f) How is area performance to be measured? Acreage compliances from existing records are inadequate measures of area compliance. Acres terraced and contour furrowed, number of gully control dams and diversion ditches, acres of cover crops, et cetera, are hardly adequate measures. Combinations within farm organizations are the components of area performance.

Regardless of the related physical and social problems, soil conservation is largely an economic problem in a democratic state. The individual is concerned with money inputs and money outputs. The sum of these individual reactions is the producers' response to the problem. There are, of course, many social considerations outside the total pecuniary interests of individuals, but Mr. Weitzell was not concerned with this phase in the article in question. There remain then, the physical and the economic considerations. To measure the physical benefits of soil and water conservation by experiment and apply these results to broad areas invites error. The results are apt to be so general as to be inapplicable except in the loosest sense. Variables that defy measurement are apt to defy application.

Specifically, Weitzell raises the following objections to the methods previously employed:⁴

Historical Method:

1. Uncontrolled variables distort income or yield comparisons.
2. Changes in management, production intensity, size of farm, and type of farming may cover up the effects of conservation.

⁴ E. C. Weitzell, *op. cit.*, pp. 479, 481, and 487.

3. Comparisons between "cooperators" and "non-cooperators" are unreal and invalid.

Budget Method:

1. Sufficient budgeting information is not available.
2. The element of personal judgment causes biased results.
3. There is a tendency to exaggerate the results of conservation.
4. There is a tendency to follow ideals or standards.
5. The process is laborious.
6. The method cannot measure minor economic effects.

Merit Point Method:

1. Conservation benefits are too small to be measured in terms of farm income.
2. The sampling process is extremely difficult.
3. There is no necessary correlation between the amount of conservation and farm income.
4. The method cannot be used for measuring conservation benefit for areas, regions, or the nation, or for measuring the effect of individual practices.

It is agreed that none of these methods provides a formula for measuring conservation benefits for areas or regions. The experimental method, however, offers but little relief from objections applicable to the other methods. One objection common to all methods is that there is no provision for measuring the effect of conservation on soil resources, either in physical quantities or economic values. It is usually assumed that the effect of conservation will be noted in increased or maintained productivity. This is a valid assumption, but at any particular time, in a dynamic state, it may be more practical to measure the unused portion of the "variable flow" in terms of differences in capital value. In the last analysis, the effect of conservation on land value must be measured. The "variable flow" cannot be measured otherwise by the economic analyst. There is no concrete evidence that there are any appreciable short-term benefits from the application of conservation inputs. As pointed out by Weitzell, there may be an inverse relation between conservation and current income.⁵ This is true for *current* conservation and current income, but this relationship cannot exist through time when *total* conservation is compared to current income. Reliance on physical productivity as a reflection of these effects is inadequate. The reflection through changes in

⁵ E. C. Weitzell, *op. cit.* p. 486.

economic productivity are necessary, but the assignment of economic values to physical input quantities applied to experimental plots is arbitrary, to say the least.

The historical method may be discarded at once as an inadequate tool for evaluating the economic benefits accruing to particular areas. Such broad and meaningless groupings as "cooperators" and "non-cooperators" are useless unless combined with some measure of the degree of conservation applied. The historical method combined with conservation merit scores may have some value, but its greatest value is in demonstrating the possibilities of a practice or group of practices in specified instances.

The budget method also has its chief value in demonstrating the possibilities of conservation under given conditions. This method is used too often to demonstrate the results desired by the investigator. It is necessary to point out again, however, that the experimental method is subject to most of the same objections.

Weitzell outlines the experimental method as follows:⁶

1. Define the practices and combinations of practices that may be considered as constituting conservation.
2. Establish test plot and field evaluations.
3. Record all inputs and outputs.
4. Estimate the value of conservation by an extension of the results to areas, regions, and the nation.

The relative merits of the experimental and the merit points methods deserve much consideration. What are the merits of the two methods as tools for evaluating conservation benefits?

Weitzell contends that conservation benefits are too small to be measured in terms of farm income. It is granted that the experimental method permits the measurement of rather small benefits, particularly if the experiments are performed on farms under actual farming conditions. The application of values to test plot inputs is a doubtful process. But even if the benefits of conservation practices can be isolated successfully, the extension of results to measure the benefits of conservation to broad areas is of limited value. Theory, whether it results from experimentation or deduction, is valuable when applied under given assumptions. The greater the variation from the theoretical assumptions, the greater is the difficulty in application. A universe that contains so many variables that it defies analysis is apt to defy the application of results obtained by

⁶ E. C. Weitzell, *op. cit.*, p. 489.

controlling these same variables. Because of this, the areas to which experimental results may be applied is apt to be so small that the method will be no more expeditious than the merit point method. A glance at a land class or a soils map will impress one with this fact. When the economic variables are combined with the physical variables, the application becomes even more difficult.

The objection that the sampling process is difficult may be directed toward all statistical analyses. Statistical investigators of economic problems are always faced with the necessity of statistical controls. The experimental method controls the "unrelated" factors in that particular experiment. When the results are used for purposes other than recommendation or administration, the variables must be handled in much the same manner as would be necessary in analyzing the universe.

The merit point method does not predicate any necessary correlation between the amount of conservation and farm income. The method attempts to measure the contribution of conservation to the farming system. This contribution may be either positive or negative at any given time depending upon the effect of shifts in land use, intensity of production, or farm organization. The merit point method proposes to measure conservation in relation to the farming system and farm organization, not in the abstractness of conservation *per se* and its unreal position as a divorce from the farm. If the merit point method were to demonstrate an inverse relation of current farm income to the total conservation applied through time, without an offsetting enhancement of the capital value of land, then conservation would be an unrewarded cost, not a benefit.

It is true that the merit point system cannot be used for measuring the conservation benefits accruing to a broad area unless a summation is made of the homogeneous units within that area and unless a measure of changing land assets is included. This is indeed a laborious process, but so is the collection of experimental data and its extension to field conditions. The merit, in either case, seems to lie in accuracy, not in the time and effort involved.

The Division of Agricultural Economics, State College of Washington, in cooperation with the Soil Conservation Service, has recently completed a study of conservation benefits in the Palouse wheat-pea region of Washington and Idaho by the "merit point system." Attempts were made to control each of the variables

listed by Weitzell.⁷ Although it is realized that complete control was not accomplished, it is felt that sufficient homogeneity was induced to permit a fairly accurate measurement of the conservation program as a whole. Perhaps the chief value of the study lies in channeling further studies. The primary purpose was to evaluate the effect of the recommended conservation program upon present income. Fairly accurate records of the amount of conservation applied were obtained from the farmer and from PMA and SCS records. Incomes on farms with varying degrees of applied conservation were noted. A six-year period, with incomes during the fifth and sixth years, was used. In this study there was no correlation between the amount of conservation and farm income.

The experience with this initial study is encouraging. Although there are many imperfections, it is felt that the method will be quite useful in measuring the effectiveness of recommended conservation programs. The use of the merit point method over a period of time may be an effective measure of the value of conservation programs as they are recommended. There is need for a method by which the economist can evaluate the recommendations of conservation planning groups.

A logical sequence of the use of the various tools seems to be as follows:

1. The historical method may be used for demonstrational purposes in areas with considerable physical and economic homogeneity.
2. The experimental method should be expanded to supply budgeting information and to indicate the probable economic benefits of particular practices and combinations of practices under certain conditions.
3. The budget method in conjunction with the experimental method should be used principally for planning and administrative purposes.
4. The merit point system with foundation in experimental results is the sounder basis for evaluating the effectiveness of recommended programs in particular areas.

No single method or combination of methods will give rapid and accurate evaluations of conservation benefits for broad areas. Intensification of effort and the passing of time are necessary for proper evaluation.

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⁷ E. C. Weitzell, *op. cit.*, p. 484.

A REJOINDER

THE foregoing commentary concerning my article entitled, "Evaluating Soil Conservation,"¹ by Maurice C. Taylor, is a welcome response. This brief rebuttal may help to clarify the issues, as I see them.

First of all, soil and water conservation must be accurately defined. Otherwise how can the analyst know what he is attempting to evaluate? Certainly there are interrelationships, but there are certain measures and practices that are known as "soil conservation." It is the effects of these specific measures and practices that should be the subject of evaluation. There seems to be no other logical starting place.

Mr. Taylor's challenge of my statement that soil conservation must be defined before it can be a usable subject of analysis is slightly misleading. Emphasis on the phrase "intended purpose" is a misinterpretation of my original statement. Apparently he has not noted that my approach would be to determine the extent to which any particular measure would influence the "conservation attributes," including reductions in soil losses, nutrient leaching and water losses.² I suggested that any measure or practice that did not positively influence these attributes could not be classified as soil conservation. My tentative classification was intended only to outline some of the measures and practices that might be evaluated to determine their effects, according to the probability of a positive contribution. My plea is for specificity with regard to what constitutes conservation. Otherwise attempts to evaluate a mixture of conservation-management unknowns are futile.

Mr. Taylor's contention that the "experimental method" of evaluation is too explicit leads one to inquire as to what his principles of scientific analysis may be. Other apparent inconsistencies make his criticism difficult to follow. For example, he indicates that

¹ This JOURNAL, May 1947, pp. 475-494.

² The initial discussion (*ibid.*, p. 477), as well as Mr. Taylor's criticism, failed to observe that *increases* in organic content and other factors contributing to productivity may be attributes of soil conservation. Strictly speaking, such increases might be considered as "rehabilitation" rather than conservation. However, inasmuch as they may occur as the result of other measures that are designed primarily to retard erosion or to prevent leaching and runoff, they cannot be divorced from conservation. In any event, the beneficial effects of conservation should be considered as those increases in productivity over that which would have prevailed without conservation. Thus, the long-time level might be higher or lower than the current level (*ibid.*, p. 486).

the enhancement of land value may be an expected effect of conservation. Yet he would eliminate the consideration of whether specific effects are immediate or long-term as having no significance. Certainly he would not capitalize short-term or current benefits (from ammonium fertilizer, for example) into land values. He writes "Whether these inputs are intended for immediate effect or a flow of benefits is unimportant except as the time element and the rate of return on investment are important." Isn't this equivalent to saying that time is not important except as "time is important"?

In addition to drawing some rather questionable conclusions as to the relative merits of "case studies," Mr. Taylor apparently fails to recognize that area or regional evaluations are one of our greatest needs. The availability of public funds for soil and water conservation should be based on comprehensive benefit-cost determinations. Toward this aim, it is hoped that economists and soil scientists will succeed in working out a reasonable procedure for projecting benefit estimates to resource areas, soil association areas, type of farming areas, or some appropriate geographic areas. My critic dismisses this possibility with the comment that to do this "is certainly to invite error." Any economic valuation must deal with variables and errors. The aim should be to develop and use that procedure which reduces the probable error to a minimum.

Farm and conservation planning present equally urgent needs for benefit-cost evaluations. If we recognize that conservation is a phase of farm production economics, it is essential that we design and apply conservation on the basis of the same principles that guide other investments. This means that the desirable intensity of application, in terms of relative costs and benefits, is a basic fact to be determined. The development of the most economical designs for guiding the application of specific measures of soil and water conservation can be done only by controlling all other factors, while observing the effects of successive inputs of the selected measure or practice. Experimental testing of the several segments of any proposed conservation program seems to be the only available technique for doing this job. Certainly it cannot be done by "farm surveys" of any type that has been conceived to date. It is true that the very small test plots used for many agronomic and soil experiments may not be adequate. In order to represent actual farming conditions more nearly, it may be necessary to use larger plots, contiguous fields, or entire farms. The principal need is for adequate

checks and controls so that the researcher can accurately observe the effects of specific inputs.

Mr. Taylor's defense of the "merit point" method of evaluation seems to be unconvincing. Perhaps the Washington study he mentions lends greater strength to his argument. However, the statement that "In this study there was no correlation between the amount of conservation and farm income" leads one to anticipate the results with several questions in mind.

After the "experimental method" has been tossed all over the campus, it is quickly reinstated through the back door, as the basis for three of Mr. Taylor's suggested evaluation procedures. It is not clear how he would use experimental data as a foundation for the merit-point method; but in general the dependence on plot, field, or whole farm experiments, planned to represent specific groups of soil resources, is a hopeful possibility.

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ECONOMIC FACTORS IN THE GROWTH OF THE OILSEED INDUSTRY IN THE UNITED STATES*

THIS study inquires into the nature and causes of the growth of the oilseed industry in the United States and gives some attention to the consequences of and prospects for the industry. The analysis is divided into a study of (1) factors affecting the supplies of, utilization of, and demand for the commodities considered and (2) the nature of, reasons for, and significance of the organizational pattern of the processing industry. The major sources of information came from publications of federal and state agencies, trade and financial publications, and general economic literature.

Supply Factors

Characteristically all production trends exhibit a rapid growth in the early years, and a gradual retardation of the growth rate. Among the oilseeds, maturation is now shown by cottonseed, flaxseed and corn germs; vigorous growth, by soybeans. Causes for such behavior may be traced to the impact of dynamic factors (population, technology, tastes, foreign trade, and social policy) on the supplies of and markets for the commodities in question.

* An abstract of a doctoral thesis presented at the University of Illinois.

1. Cottonseed and related products—the supply of an oilseed produced as the minor product of a joint output depends largely on the output of the major product. The cotton crop was about six times more valuable than the cottonseed crop in the past 35 years,

In the past century and one-half the expansion of cotton production was due to availability of new land, abundant labor supplies, improved transportation, improved techniques of producing cotton and the expansion of foreign and domestic markets for cotton. The gradual retardation of growth of cotton production was based on the increased foreign production of cotton, production of substitute fibers, slackening of the domestic population growth rate, the limited reserve of new lands, and restrictive social policy. However, ameliorating factors have tended to impede the decline (e.g. improvements in yields, increased domestic per capita consumption of cotton). The peak of U. S. cotton production was reached in the 1920's and there appears to be no bright prospect for reversing the decadent tendency in the future.

The cotton seed crushing industry began in the 1850's but experienced its important growth between 1870 and 1910. Factors in its growth (other than the availability of cottonseed) were the development of processing techniques, transportation and markets for cottonseed products. After 1910, the percentage of cottonseed crop (not used for seed) crushed, averaged 88 per cent and varied from year to year directly with real prices received for cottonseed and inversely with real cash incomes from cotton. In the main, the supply response was inelastic and little significance can be attached to prices or incomes in explaining the annual variations in supplies of cottonseed. The development of appropriate solvent extractor systems could increase the annual cottonseed oil supply as much as 15 percent. Future increases in cottonseed oil production are more likely to come through this avenue than through others, but the change probably will be slow.

Imports of cottonseed or cottonseed products have been minor factors in the total domestic supplies. Cottonseed is not an international commodity in the usual sense and production of cottonseed products has been a backward industry in most cotton producing countries.

2. Corn germs—Corn oil is produced mainly as a minor product of the corn refining industry as well as in the corn alcohol and corn

milling industries. The corn refining industry grew into maturity in the past half century and further expansion of the output of corn oil is mainly contingent upon its rejuvenation through the discovery of a larger market for starch or glucose products.

3. Soybeans and related products—Soybeans are relatively new as a grain crop, important acreage expansion occurring in the 1930's. The highest per acre yields are obtained in the Corn Belt where production is most concentrated. Analysis of crop acreage changes since 1925 in Illinois, Iowa, Indiana, and Ohio by crop reporting districts (80 percent of U. S. soybean production) indicates that soybeans tended to displace all major uses for tillable land rather than any selected crop(s). However, in the recent 1940-44 period corn and soybeans were most directly substitutable. The soybean-corn acreage ratios varied inversely, and significantly with the corn-soybean yield ratios. Oats and wheat were not significantly associated with soybeans in this respect. In earlier periods, small grains and soybeans may have competed more closely.

An analysis of both gross and net returns per acre from soybeans and other major crops from 1930 to 1944 indicates that soybeans were more profitable than small grains, but less profitable than corn, except perhaps in the 1930-34 period. However, complementary and supplementary relationships between different crops tend to obscure the relative advantage of growing one crop in place of another when comparisons are made without regard to these interrelationships. The soybean crop has several such interrelationships with other crops.

The important factors underlying the growth of soybean production were: A relatively greater improvement in per acre yields of soybeans than in yields of alternative crops, prior to 1940-44; the drouth and disease resistance of soybeans; a relatively greater reduction in costs of producing soybeans than of corn, since 1932; and the governmental production adjustment programs, particularly those of 1934, 1935, 1939, 1940, and 1941. Probably the acreage of soybeans would have expanded had there been no drouth or governmental programs, but the latter factors were important. The parity payment feature of the 1939-41 programs was a more important factor in reducing corn acreage than was the financial attractiveness of soybeans.

Although the future of soybean production is difficult to predict, soybeans have established themselves as an important commercial

crop. Quite apart from the future level of soybean production, the areas are likely to shift in importance. Production may increase in the flat clay-pan areas of Illinois, Indiana, and Missouri if general soil improvement practices are followed. Much idle land there may be brought into cultivation. On the other hand, improved corn yields in the commercial each corn area (due to improvements in soil management) will reduce the acreage in soybeans.

The soybean processing industry developed more rapidly than the cottonseed processing industry, and the more efficient solvent process is replacing mechanical methods. About 15 percent more soybean oil could be secured from the annual crush if the solvent process were universally adopted.

4. Flaxseed and other oilseeds—The production of flaxseed in the United States has begun to change only in recent years from a pioneer sod-land crop to a well-established crop in settled areas. Accompanying this trend, the production areas have shifted back eastward. Only since 1939 have per acre yields become relatively stable, reflecting, in part, adoption of wilt-resistant varieties, better cultural practices, and selection of more suitable areas. On this basis it may be assumed that the production of flaxseed in the United States will increase in future years. However, only limited regions can grow the crop successfully, and flaxseed will probably remain in deficit supply. Imports will probably continue to balance requirements for linseed oil for drying purposes.

The copra and palm tree industries of the East Indies developed rapidly since World War I. The United States has imported large quantities of these oil products for use in soap and various foods until the 1930's after which the imposition of certain taxes somewhat limited imports. Both industries are relatively young and new areas and improved techniques of production will probably contribute toward greatly increased supplies in the future, even at low prices. The long production period and use of native labor permit high output at prices that just cover the relatively flexible variable costs. Hence, the oils will compete strongly with domestically produced fats and oils. However, the need for improved transportation, etc. will impede the rapid expansion of exports.

The babassu industry in Brazil is similar to, but younger than, the copra and palm industries in the East Indies. The potential production apparently is large; however, technical difficulties may hold down the industry for a long time. As yet the United States

has not placed import duties or excise taxes on either the imported babassu oilseed or oil.

The peanut and olive in the United States are used as food rather than crushed for oil. Although both are protected with relatively high duties, the prices of peanut and olive oil are not attractive enough to induce a large domestic supply.

Castor beans, tung nuts, and sunflowers have been minor oilseeds in the United States. The castor bean has usually been imported more cheaply than it can be produced domestically, although certain technological advances in the future and/or tariff changes could alter this somewhat. Domestic production of tung nuts is limited by exacting requirements of the tung tree and the high labor requirements in harvesting. Presumably, production could increase when and if the crop shifts from large scale commercial production to small family farms in the narrow southern belt in which the crop is adapted. The sunflower is used for forage and feed in the few states where it is grown extensively. Difficulties with yields and harvesting would have to be overcome to make the crop profitable for oil purposes.

Such oilseeds as are obtained from the sour cherry canning industry, the dried fruit industries, and the fruit juice industries are interesting rather than significant in the total supply of oilseeds. The particular problem in these industries is to secure sufficient volume to make crushing profitable.

The tropical tree crops have a competitive advantage in production over annually produced oilseed crops, except those which are minor products of joint outputs.

Utilization and Demand Factors

1. Vegetable oils—The U. S. per capita domestic disappearance of all fats and oils increased 17 percent from 1920-24 to 1935-39. In 1940, about 40 percent of the fats consumed were of vegetable origin. Food soap, and drying oil products were the principal uses. Invisible fats (in milk, eggs, meat, etc.) make up nearly one-half of the total food fats consumed in normal periods. In 1917-18 and 1944-45, the consumption of invisible fats increased, replacing the decreased consumption of visible fats. Thus there is competition between the two forms of fat for a place in the diet, but no trend is discernible in their relative importance.

Among the visible fats, the per capita consumption of vegetable oil products increased most. Consumption of pork fat cuts and

butter did not increase. The quantity and quality of fats consumed are directly related to family income. Low income groups consume less fat than medium and high income groups. Higher income groups may eat no more fats than medium income groups, but they consume more expensive forms of fats (e.g. butter, shortening, salad oils, salad dressings, etc.). The lower income families consume more lard and margarine.

Shortening, which developed historically as a substitute for lard, has become a distinctive product in its own right, and ways are being sought to give shortening-like properties to lard. However, production of shortening is still adjusted to the quantity of lard available for sale in the domestic market. Therefore, total lard production and exports are extremely important to the consumption of shortening. Although there is no evidence that the demand for shortening agents (lard plus shortening) increased in the 1912-41 period, there is evidence that the demand for shortening by itself increased. Accompanying an increased demand for shortening there was a marked decrease in substitution of the two products (as indicated by the decreasing elasticities of substitution). Product improvement and sales efforts were causal factors. Soybean oil has replaced cottonseed oil as the major ingredient in shortening despite its tendency to flavor reversion. This reflects the relatively inadequate supplies of cottonseed oil, on the one hand, and possible improvements in soybean oil as an ingredient, on the other hand.

Margarine competes with and adjusts itself to changes in butter consumption. The future of margarine depends on this and on technical improvements in the margarine product, educational campaigns, and the character of discriminatory legislation. There is no evidence that the demand for margarine has increased over the 1910-41 period; prices declined sharply and consumption increased more gradually. Since 1934, cottonseed oil and soybean oil have become the important ingredients replacing coconut oil. The shift from coconut oil reflects the effect of restrictive taxes on use of imported oils and of technical improvements in the use of domestic oils in margarine.

Salad dressings doubled in output from 1931 to 1941. Consumption appears to be related to increasing consumption of green and yellow vegetables. The very high grade edible oils (e.g. cottonseed, corn, sesame, etc.) were usually used.

The per capita production of soap has been increasing. There is some evidence of an increased demand for soap, 1925-39, reflecting

increased incomes, a trend toward cleanliness, use of home washing machines, and sales efforts. The imported lauric acid oils have a technical advantage as ingredients. The upward trend in soap consumption will probably continue.

The consumption of drying oils is intimately related to changes in industrial production and construction. There is evidence that the secular demand for drying oils remained constant, 1912-41. Although tung, perilla, and linseed oils are the naturally superior drying oils, recent technical advances will place castor oil and soybean oil in a somewhat stronger competitive position.

2. Oilmeals—Nearly all the vegetable oilmeals are used in the domestic feeding of livestock. Minor amounts were used for food, industrial products or processes and for exports. The oilmeals are valued by feeders principally for their high-protein content. Competing closely with the oilmeals are the animal proteins, millfeeds, and brewers' and distillers' dried grains. However, the bulk of the protein fed to livestock comes from pasture, hay, silage, stover, and grains. Small changes in quality and quantity of the roughages and grains can cause profound changes in the amount of high-protein concentrates required.

There was a marked upward trend in the quantity of commercial high-protein feeds fed per unit of livestock, 1926-27 to 1944-45; but more proteins are still needed to balance livestock rations. Increased nutritional knowledge, increased livestock numbers, and educational efforts of governmental agencies and the feed industry have been important factors underlying the trend.

The major change in the demand for feeds, apparently, has been the increased demand for soybean oilmeal. This was a factor contributing to the rise of the soybean industry. The prospect for increasing the demand for the oilmeals depends upon the total demand for proteins and upon the supply from alternative sources.

The increase in soybean meal since 1934 has been spectacular. Most of the increase in high-protein feeds has been in soybean meal. This has helped to fill a gap in animal feeding requirements and has been an important factor in the expansion of animal feed-stuffs that occurred during the war. If demands for the oilseed meals increase, it appears that soybean meal production is likely to increase more than the other oilseed meals to meet these demands.

Organization of the Processing Industry

1. *Plants.* The oilseed processing industry may be divided into

fourteen census industries on the basis of the major products produced. These industries have the common characteristic of utilizing large quantities of oilseeds, vegetable oils or oilmeals in their processes. They represent the several segments of the oilseed industry adequately for present purposes even though they did not produce the entire output of their major products, nor confine themselves to the manufacture of the main product.

Like most manufacturing industries, size of plants varied widely in the several industries studied. These variations are due to (1) the different grades of resources available to the individual plant (2) the strategic decisions in fitting the plant into an integrated firm's production scheme and (3) lagging adjustments to changing conditions. That there was more concentration within some industries than others is due to the specific economic conditions in each industry.

Processing margins tended to decrease with increased plant size except in certain industries where monopolistic elements may be quite marked.

Comparison between principal plants in different segments of the oilseed industry showed them to vary in size, degree of mechanization, annual wages paid and processing margins. These variations have rational explanations. For example, the processing margins of the manufacture of industrial oil products (soap, paint, linoleum, printing ink, artificial leather and oilcloth) were roughly twice as large as the margins of the crushers, manufacturers of edible oil products (except margarine), or mixed feeds. The economic explanation is mainly in terms of production costs, partly in terms of monopolistic elements.

2. *Firms.* Most of the important plants in the industry belong to multiplant firms. A small number of firms in each segment of the industry, with few exceptions, produced over one-half of the output of their segment. This concentration is characteristic of all manufacturing industries in the United States. However, in at least seven of the fourteen segments the concentration has lessened during recent decades. The relative concentration among these industries may be explained by a set of economic forces operating through materials, processes, products, or markets.

Vertical integration was the least important type of integration in the industry. Only 10 percent of the crushers' products were reported as inter-plant transfers in 1939, even though 30 percent of the plants reported such transfers. The complex interrelationships

among processes make it difficult to integrate precisely. Horizontal integration was prevalent throughout the industry, particularly in the industries having relatively small, widely scattered plants. Partial integration (based on similarities in materials, processes, or markets) was a common characteristic of multiple product businesses, e.g. soap-shortening, flaxseed-soybeans, paint-printing ink, etc. The type and degree of integration present in each of the oilseed industries have an economic explanation based on the logical avenue for expansion available to the individual firm.

There was no evidence as to whether large, medium, or small businesses in the industry were most efficient. In individual cases, efficiency would appear to be as much a function of management as of size, and comparisons between firms within an industry are impaired by the differences in the product make-up of their businesses.

The prerequisite for monopolistic behavior existed in some segments of the industry—a small number of buyers or sellers (resulting from industrial concentration, product differentiation, or collusion). However, the degree to which a raw material has alternative uses, or a manufactured product meets good substitutes, limits the area in which monopolistic control can be made effective. For example, the highly concentrated corn refining industry can exert relatively little effect over the price of the corn it purchases (since most corn is used elsewhere) nor can it set prices of starches, sugars, syrups, or oil very freely in view of the many substitutes available for these products. On the other hand, conditions in the linseed crushing industry permit more control over the prices paid for flaxseed and the prices obtained for linseed oil. What degree of control is actually exercised in the latter industry is undetermined. In these and in other industries, the elasticities of the supply and demand curves are more significant facts in analyzing monopolistic possibilities than is the condition of small numbers. The competitive elements in the oilseed industry appear, by and large, to be more important than the monopolistic elements and any detailed appraisal of monopolistic behavior within the industry should also inquire into cost conditions and the permanence of monopolistic situations before judgments are rendered.

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REVIEWS

Towards World Prosperity, Mordecai Ezekiel and Associates, New York: Harper and Brothers, 1947. Pp. XIV, 446. \$5.50.

The central thesis of this book is that, given political cooperation and security between nations, world prosperity is technically possible through balanced industrial and agricultural development and expansion. However, this will require planning of a very high order for "real prosperity for the world can come only if the rate of development of processing, manufacturing, and other nonfarm industries can be speeded up to match the technical progress already made in agriculture and the still greater technical progress which lies ahead as the agricultural methods of modern science spread over the world." (P. XIV.)

This book contains 22 chapters of which the first two and the last were written by Mordecai Ezekiel, and the others by 19 specialists on different countries or areas of the world. In the introductory chapters, Ezekiel states that the war had much less effect on agriculture than on industry. Some importing countries were forced to expand domestic supplies or seek new sources of imports, while some exporting countries found their usual markets cut off or restricted, "... yet the general structure of food production and consumption was not revolutionized" (p. 1). On the other hand, profound change took place in industry where emphasis was placed on implements of war and on equipment for the military forces. In large areas, physical resources were depleted, human resources destroyed or badly warped, and internal and international property rights scrambled.

Ezekiel believes that the maintenance of full employment in the highly industrialized countries and the development of nonfarm industries in the less advanced countries are major postwar problems. He believes that any given country can make progress on the industrial front if it has the will to do so. Perhaps the best example of all history is that of Russia which made the shift "from a backward nation to modern industrial nation within a single generation" (p. 23). While such a shift is possible with little outside help, in a country rich in resources, it requires regimentation and sacrifice on the part of the people that few would wish to emulate. Hence, Ezekiel places emphasis on the need for the United States and other

leading nations to supply technical information and financial aid to the technically less advanced countries.

The greater part of the book is concerned with possibilities and suggestions for economic development in selected countries and regions of the world. On the whole, the authors have done a good job of describing the human and natural resources and of analyzing the problems involved in the economic development of the various countries and regions included in the book. The introduction and expansion of nonfarm industries is essential to the lifting of living standards in the technically backward countries, and these countries contain the great majority of the people of the world. Emphasis throughout the book is placed on the need for technical advice and financial aid from the more advanced industrial nations, chiefly the United States. The summation of the financial aid suggested for the individual countries gives a total of enormous proportions.

This reviewer is of the opinion that the authors of *Towards World Prosperity* have painted a somewhat too rosy picture of the prospects for success of the various world-wide organizations which were established during and since the recent war. He also believes that the willingness of the people of the United States to loan enormous sums to all who need or think they need outside aid has been dampened considerably by past experience with many countries that seem to feel that their external debts should be paid only as a last resort. In short, the future economic development of the world is likely to depend to a much greater extent upon self-help than is envisioned by the editor of *Towards World Prosperity*.

However, the time has come when the people of the United States must acquaint themselves with the human and natural resources of the world and with the many complex problems involved in bringing about more rapid and more general economic development. *Toward World Prosperity* will be helpful to this end.

AUSTIN A. DOWELL

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Causes of Annual Fluctuations in the Production of Livestock and Livestock Products, James H. Lorie, Chicago: University of Chicago Press, 1947. Pp. 105 \$1.50.

Lories starts out with a clear outline of the field he is going to cover.

"It is the purpose of this study to ascertain the most important immediate and ultimate determinants of annual fluctuations in the production of livestock and livestock products in the United States and to measure statistically the relationship between these determinants and livestock production for the period from 1910 through 1944."

"The last chapter develops a form of production function for livestock products which may be used with appropriate data by animal husbandrymen to measure the marginal productivity of feedstuffs and of animal units and by meatpackers and other processors to estimate the volume of production of particular livestock products."

Horses and mules are not included in the index of production of livestock, which refers to increases in the weight of live animals on farms. The index of the production of livestock products refers to eggs, milk, and milk derivatives, and in addition, to beef, pork, lard, lamb, mutton, and other products of livestock slaughter.

Pasture, and wheat for feed, are omitted from the index of feed supplies, but not of feed consumption. The author concludes that feed consumption in any year closely approximates the production of feed in the preceding production period (although they change in the same direction only a bit more than three-fourths of the time) the effects of changes in carryover being small. On the average a change in feed supplies of one percent causes a similar change in feed consumption the next year of 0.9 percent. Changes in feed supplies are primarily weather-induced. A one percent rise in feed supplies above trend was accompanied on the average by a rise in animal units the following January 1 of 0.6 percent, and a decline in feed supplies, by a decline in animal units of 0.2 percent.

The author demonstrates in Chapter III that livestock production per unit of feed consumed varies inversely with the rate of feeding, confirming the earlier experimental studies of Nelson, Atkinson, and Klein. With a given consumption of feed, therefore, the production of livestock products varies directly with the number of animal units being fed. The author then analyses cyclic movements in the numbers of the different kinds of livestock.

In Chapter IV, the author sets up a logarithmic production function for livestock, based on a multiple correlation study, where X_1 is the volume of livestock production per year, X_2 is the volume

of feed consumption per year, X_3 is the number of animal units fed per year, and X_4 is "time."

When a linear regression line was fitted to the logarithms of the data, the following coefficients resulted:

$$\begin{array}{ll} a_{1.234} = 0.3161 & b_{13.24} = 0.5230 \pm .0478 \\ b_{12.34} = 0.3299 \pm .0296 & b_{14.23} = 0.0021 \pm .0001 \end{array}$$

The ranges of the regression coefficients are equal to two standard errors.

The standard error of estimate, the unexplained variance, the multiple correlations coefficient, and coefficient of determination follow:

$$\begin{array}{ll} \bar{S}_{1.234} = .0167 & \bar{R}_{1.234} = .95402 \\ \bar{S}^2_{1.234} = .00028 & \bar{R}^2_{1.234} = .91083 \end{array}$$

The marginal productivities of feed consumption which are shown in an erratum slip correcting pages 93 and 94 range from 0.27 for a marginal product index of 120 and an animal unit index of 80, to 0.44 when the values of these two indexes are 80 and 120 respectively. Correspondingly, the marginal productivities of animal units range from 0.47 to 0.65.

Chapter IV is entitled "A Production Function for Livestock and Livestock Products." The author explains in correspondence that X_1 is an index of both livestock and livestock-product production.

Lorie debated whether to use data going as far back as 1910. Hindsight, especially with reference to figure 28, prompts me to believe that more accurate results would be obtained by omitting the years 1910-20, although the results then would be even more dominated than they are now by the few extreme years during World War II.

GEOFFREY S. SHEPHERD

Iowa State College

The Farmer in the Second World War, Walter W. Wilcox. Ames, Iowa: Iowa State College Press, 1947. pp. 410, \$4.00.

It is interesting to speculate whether and how American agriculture prior to and during the Second World War might have been different had some predecessor of Professor Wilcox written such a book as this in 1920. Of course, no one during World War I really

believed that agriculture's contribution to victory was small, yet it is unlikely that there were many in those days who would have gone so far as to say that "food will win the war and write the peace." In any event, it is high time that *the farmer* be given greater recognition for his contribution to world economics not only "in the Second World War" but in all wars and more especially in times of peace.

In bringing the wartime agricultural problems and accomplishments into sharp focus in this book, Professor Wilcox has done his country and its farmers a distinct service. He has not, however, been content with mere description or even with the inclusion of a wealth of political and economic background material but has interspersed the whole with his own illuminating and objective interpretations. The result is an historical study which is easily read, thoroughly documented, and highly useful.

Introductory chapters deal briefly with the significance of the war to agriculture, agriculture at the outbreak of the war, public institutions serving agriculture and problems incident to the change from a peace time to a war time agricultural economy. The next four chapters take up, in succession, wartime agricultural production, marketing, use of man power, and use of land. Data from official records are presented to give emphasis to agriculture's phenomenal production record; the increased use of farm machinery, larger output per worker, advances in ideas regarding nutrition, reductions in trade barriers, significant shifts in land use, and the growing importance of farm forestry.

It is in the next seven chapters (9 through 15) that Professor Wilcox has opportunity to draw upon his background and experience as he discusses the controversial issues centering around the formulation and administration of price policies for agriculture. He reviews the controversy which raged between the administration which wanted separate controls on prices and wages and Congress which, on the one hand, wanted to include wage controls in price control legislation and, on the other, to avoid price ceilings on agricultural products except at parity levels or above. The result was an unfortunate delay and a continued increase in the price level. Here also is revealed something of the "behind the scenes" maneuvering which went into price control legislation and which eventually paved the way for incentive payments or agricultural

subsidies in lieu of higher market prices.

The remaining chapters (16-23) are concerned with such topics as technological development, international trade, industrial expansion, the changing role of the Department of Agriculture, and the increasing influence of farm organizations.

In the opinion of the author there was in the United States an almost total absence of any agricultural planning for war even as late as December 1940. Fortunately, the agencies serving agriculture at the outbreak of the war did not, for the most part, find it necessary to undergo extensive reorganization as a result of the war. One of the things which caused agriculture so much trouble during the war was the mechanical use of the parity formula made mandatory by Public Law 74 (May 1941). This was followed by the so-called Stegall amendment which promises to provide its share of trouble during the first two full years of peace.

Professor Wilcox is critical of the policy of continuing into the war years peacetime activities "only indirectly contributing to the war effort." In this connection he cites both the AAA and the SCS. "In some ways," he adds, "the Farm Security Administration was more 'war conscious' than any of the other agencies." However, the FSA is taken to task for increasing its activity in the North Central States and decreasing its activity in the South during the war period. "Just the opposite should have happened," he says. "Congressional action" is blamed for failure of cotton and wheat farmers to make larger shifts "in line with needed peacetime adjustments."

Although some progress in marketing is noted, Professor Wilcox feels that of more significance are the "additional economies which might have been, but were not achieved."

In appraising price policies during the war the author states that the "greatest mistake . . . was the imposition of price ceilings . . . without adequate provision for keeping the supplies flowing through the established channels." Professor Wilcox will probably agree that a close second might well have been the *maintenance* of price floors on commodities not essentially needed in the war effort. However, this reviewer (who is reasonably familiar with the South and who was somewhat involved in the determination of wartime production goals) finds it hard to believe that response to this latter policy resulted in a production record which would justify his charge that "the outstanding example of misused human and

other resources in agriculture . . . occurred in the Cotton Belt." Either the Professor is unfamiliar with the record or he greatly overestimates the resources.

G. H. AULL

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Two Blades of Grass, T. Swann Harding, Norman, Oklahoma: University of Oklahoma Press, 1947. Pp. xv, 332. \$3.50.

This book, a history of scientific development in the U. S. Department of Agriculture, owes its title to a statement of the first U. S. Commissioner of Agriculture, Isaac Newton, "a good Pennsylvania dairy farmer," who wrote in his first Annual Report, dated January 1, 1863:

"It should be the aim of every young farmer to do not only as well as his father, but to do his best; 'to make two blades of grass grow where but one grew before.'" Scientific research in agriculture has been the primary factor in making possible this achievement. The author, T. Swann Harding, evidently had no desire to indulge in higher praise, or perhaps in odious comparison, else he could have quoted an earlier source of the now familiar allusion. More than 200 years ago Jonathan Swift in "Gulliver's Travels" put into the mouth of the King of Brobdingnag these words:

"Whoever could make two ears of corn or two blades of grass grow upon a spot of ground where only one grew before, would deserve better of mankind, and do more essential service to his country than the whole race of politicians put together."

Chapters 1 and 2 trace the early beginnings of agricultural science in the federal government thru the period from 1839 (with the first agricultural appropriation of \$1000 to the Patent Office in the Department of State) to 1862 when Lincoln signed the act creating the U. S. Department of Agriculture. The depression beginning in 1837 was a significant fact perhaps which, among other things, prompted Henry Leavitt Ellsworth then Commissioner of Patents "to do something for farmers."

The last Commissioner and first Secretary of Agriculture, Norman J. Colman of Missouri was largely instrumental in effecting passage of the Hatch Act in 1887. In 1889, Colman was the first Department head to hold a seat in the Cabinet. Soon thereafter with the depression of the 90's the social sciences began to find a

place in the Department. As the title implies this book does not cover the contributions of the social sciences, although the author does recognize their importance in several places. He concludes his chapter on early research with "It should be said here that the Department's policy of making two blades of grass grow where one grew before, while eminently successful, did not suffice to solve farmers' problems . . . That is why the social sciences began to infiltrate the Department, getting their start in its scientific agencies." It was not until the administration of David F. Houston, 1913-1920, however, that the Department was reorganized to "cope with the rising economic and social problems it had too long ignored or given scant attention."

Part II, Achievements, includes Chapters 5 to 14, and recites the, scientific accomplishments in a wide variety of fields: chemistry entomology, plant breeding and plant pathology, forestry, animal production, soils, nutrition, dairying, and agricultural engineering. Chapter 10 deals briefly with the development and scientific contributions of the state agricultural experiment stations. Appearing throughout the book are names of many persons prominent in the development of agricultural science, such as, Wiley, Salmon, Atwater, Fairchild, and Swingle.

The reader is impressed also with the recital of names of men, little known, but of sound scientific training who "have continuously served us unaware." Leonard L. Harter, in cooperation with state agricultural experiment stations, developed control measures for sweet potato diseases which resulted in a saving of five million dollars annually. Like many other scientists, he built up a huge annuity—which, however, accrued to the general public."

Part III recites achievements of scientific agencies which were developed, and which until in recent years were administered by the Department of Agriculture, with chapters on the Weather Bureau, Public Roads Administration, Fish and Wildlife Service, and Food and Drug Administration.

Part IV, Values, contains the single chapter, "Value of Pure Research." The works of Liese Meitner, Enrico Fermi, Alexander Fleming, Gregor Mendel and others are impressive examples of the priceless value of pure, as opposed to applied, research. Although some of the assumptions usually underlying such calculations may be questioned, impressive examples of the strictly monetary value of Department research are noted throughout the book. "Returns of

500 to 10,000 percent in the investment in research are not at all uncommon."

Despite the results, the agricultural industry in 1938 spent only .37 per cent of its gross income for research, conducted almost wholly by governmental agencies. In the same year industry spent 1.7 per cent of its gross income on research and many private concerns used 4 to 5 percent for this purpose.

"Two Blades of Grass" is an interesting story of the development of agricultural science in the past century. Social scientists will find it a valuable history of agricultural achievements and a reference book worthy of being kept in a handy place.

F. F. LININGER

The Pennsylvania State College

The American Farmer, His Problems and His Prospects, Lee Fryer, New York: Harper and Brothers, 1947. Pp. X, 168.

This book is about farm people—working farmers, their problems, their resources, the institutional arrangements that often squeeze the life blood out of them, their houses, their health, their income or lack of it, their ugly poverty, their inarticulate hopes and ambitions, and their future. The title of the book might suggest that this is just another treatise dealing with "the farmer" as an abstraction or as a generic entity, without giving recognition to differences that exist as among the bottom, the middle, and the upper farm income groups. Any such conclusion would be erroneous. It is the plight of the three to four million working farmers—the sharecroppers, the tenants, the mobile farm laborers, the small family-size farm operators—these are the farmers about which the author writes with understanding and with compassion.

It may be that the author appraises "the American farmer" from a viewpoint that has been influenced somewhat by his years of experience with the Farm Security Administration. But for the most part the book is factual and objective. There is evidence of a passionately crusading spirit and a burning desire to find a better way of life for the great mass of working farm people than they now know. Unfortunately for these farm people, according to the author, there has been no standard of ethical principle to use for reference, no public conscience based on a clear idea of human needs and decent living, but only the savage interplay of interests and pres-

tures, with the exploiters of rural people organized and the victims going it alone.

Despite the fact that American agriculture has every resource needed to make farm life secure and wholesome, it keeps two-thirds of its people in economic jeopardy and one-third in bitter poverty. The great majority of American farm women live and work under squalid primitive conditions, in houses that are far below the standard enjoyed by other groups. The health status of farm people has deteriorated sharply since the first world war due to inadequate or nonexistent health facilities and services.

Four bedrock problems are found to be back of the unfortunate status of agricultural people. First, the poor distribution of land among farmers: too many farms have too little land. Big farms and small farms are growing in numbers and relative importance, while middle-sized farms are diminishing in importance.

Second, the relationship of farm families to the land they cultivate, which includes farm tenure, debt, and mortgage. It is pointed out that farm people too often buy the right to use farm land with the clothes off their backs. Many of the old and the new problems have their roots deep in the institutional patterns that govern these relationships.

Third, the poor use made of the farmer's labor and capital resources. While rural America is spending one man-hour of labor to produce goods worth only \$1, industrial America produces goods worth \$4 to \$5 with the same amount of manpower, according to the author.

Fourth, the isolation of the individual farmer. Every agency with which the farmer deals is organized, either directly or indirectly. Working farmers must have an organization of their own, for without organization the ordinary farmer has no power to speak in any of the many places where his voice should be heard. The author thinks the present major farm organizations do not represent or speak for the "working farmer."

The author, in dealing with a charter for reconstruction, maintains that rural communities must assume responsibility for the reconstruction of agriculture and the employment of rural people in productive work with incomes up to the American standard. Such a program is to be implemented in part by the passage of an enabling act for the creation of community authorities to promote commun-

ity reconstruction, including the regulation of the ownership and use of farm land in accordance with sound national and local policies.

In the reconstruction plan, a very great deal of emphasis is placed on a closely knit, strong farm organization working effectively through far-flung cooperative units. Some readers may think the author has a naive faith in the ability of low income farm people to organize and initiate the program of reconstruction as outlined. Moreover, it is not quite clear just where or how the generating force is to come into existence that will arouse the community to do the job as outlined for it.

In the proposed program of reconstruction the matter of high commodity prices is conspicuously absent. The observation is made that small farmers and family farmers must realize that high prices are not the key to a secure and prosperous future.

This little book of 168 pages is interesting and challenging throughout. It may not receive the attention it deserves during this period of economic and political reaction and at this time when the basic ills of millions of low income farmers are temporarily obscured by abnormally high war and post-war prices and by a high level of employment; but there is reason to believe that its proposed charter will be carefully appraised and appreciated when all of the old ugly problems of rural poverty and unrest, together with many new ones of the post-war period, rise again to plague the country anew in the years ahead.

Out of the apparent zeal for the welfare of poor and distressed and unorganized farm people, the author may have drawn conclusions and made judgments about institutions and economic groups that some may think are harsh and without full justification. The story as a whole, however, portrays in graphic fashion the plight and the problems of the great mass of agricultural workers. The real American farm problem, which has to do with economic causal forces and with human beings, is brought to sharp focus. The proposed remedial measures are challenging and stimulating, even if certain aspects of the reconstruction charter may be controversial and a bit idealistic. All students of American rural life will want this little book in their collection.

FRANK J. WELCH

Mississippi State College

Jesse Buel, Agricultural Reformer. Selections from His Writings Edited, with Introduction by Harry J. Carman. New York: Columbia University Press, 1947. Pp. xxxvi, 609. \$6.75.

Jesse Buel (1778-1839) was one of the most eminent agricultural statesmen of his generation, but like many other Americans who have devoted their energies and vision to the cause of better farming and the improvement of agriculture as a way of life, we have known comparatively little about him because of the lack of a well-rounded account of his life and contributions. Dean Carman's introduction to this volume supplies this need very well.

Buel's career as an agriculturist was relatively brief, but he accomplished much during that time and pointed the way for later generations. Having achieved success as a printer and businessman, Buel turned to the problems of farming and rural life in 1821. By scientific methods he made his 85-acre farm in the sandy barrens west of Albany, New York, a paying enterprise as well as a veritable agricultural experiment station. In order to disseminate the principles of improved farming, Buel carried on extensive correspondence, served as secretary of the New York State Board of Agriculture, wrote many articles for the agricultural press, made *The Cultivator* which he edited the most popular farm periodical in the country, and promoted the cause of agricultural education in the New York legislature and elsewhere. Motivating his many and varied activities was his profound faith in the importance of agriculture to a nation and in the necessity of an educated citizenry if democracy was to survive and fulfill the destiny which he visualized for it.

The main part of this volume consists of writings on agriculture by Buel himself. The first section (pages 3-129) is devoted to correspondence, editorials, and articles by Buel from *The Cultivator* and other farm periodicals. The second (pages 133-255) provides the texts of Buel's addresses before agricultural and horticultural societies. The third section (pages 259-586) is a reprinting of the 1839 edition of Buel's book, *The Farmer's Companion*, and its appendices.

Agricultural economists will be especially interested in this edited reprinting of *The Farmer's Companion*, and comparisons of its contents with those of a comparable modern handbook would be enlightening. The book was originally prepared at the request of the request of the Massachusetts Board of Education for use in the

school and rural libraries of that State. Its twenty-seven chapters are a summary of Buel's agricultural experience and wisdom. They cover practically every phase of husbandry and reveal the author as a master in his time. Concerning the book's scientific and literary attainments, Buel himself wrote: "I write as I think and practice; and have endeavored to adapt my style to the capacities of common readers Indeed, so far as my ability would permit, I have endeavored to unite science and art, as I think they ever ought to be united, in all the business of farming of which I have treated." According to Buel, "The great objects of the farmer should be to obtain the greatest returns for his labor, without deteriorating the fertility of the soil: and to restore fertility, in the most economical way, where it has been impaired or destroyed by bad husbandry."

The introduction is an excellent interpretative summary of Buel's life. The editorial annotations are well done. Although there is apparently no entry that leads to such data as Buel's outline of objectives for a board of agriculture (pages 50-51) which Commissioner Newton is supposed to have used as a guide in inaugurating the United States Department of Agriculture, the index is probably adequate. The volume is a significant and useful addition to the literature on agricultural history.

EVERETT E. EDWARDS

U. S. Department of Agriculture

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- Carman, H. J. , "Jesse Buhl, Agricultural Reformer," New York: Columbia University Press, 1947. Pp. 410. \$4.00.
- Collings, Gilbeart H., "Commercial Fertilizers," 4th edition, Philadelphia: The Blakeston Co., 1947. Pp. 498.
- Dewhurst, J. F., "America's Needs and Resources," New York: Twentieth Century Fund, 1947. Pp. 812.
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- Ezekiel, Mordecai and Associates, "Towards World Prosperity," New York: Harper and Brothers, 1947. Pp. xiv, 446. \$5.50.
- Goldschmidt, Walter, "As You Sow," New York: Harcourt, Brace and Company, 1947. Pp. 275. \$3.00.
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- Kaplan, A. D. H., "The Guarantee of Annual Wages," Washington: The Brookings Institution, 1947. Pp. 226.
- Pond, G.A. and Boss, A., "Modern Farm Management," St. Paul: Hedde Webb Publishing Co., 1947. Pp. 884. \$4.00.
- Report of the China-United States Agricultural Commission, Washington: Office of Foreign Agricultural Relations, 1947. Pp. 264.

Back Issues Wanted

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The following back issues of the JOURNAL are needed. If you have usable copies, the secretary-treasurer will pay \$1 each for:

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Vol. III (1920) No. 1 (Feb.), 2 (May)

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L. J. Norton, Secretary-Treasurer
305 Mumford Hall
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NEWS NOTES

The Sixth International Conference of Agricultural Economists was held August 28 to September 6 at Dartington Hall, Totnes, Devon, England. In addition to 20 Americans and some 30 British, representatives were present from Australia, Belgium, British West Indies, Canada, China, Czechoslovakia, Denmark, Egypt, Finland, France, Germany, Hungary, India, Italy, Netherlands, New Zealand, Palestine, Poland, Spain and Switzerland. The proceedings were in English, were transcribed, and will be published. This conference was initiated in 1929 at Dartington Hall and four subsequent conferences were held before the war, at Cornell University in 1930, Bad Eilsen, Germany in 1934, St. Andrews University in Scotland in 1936, and Macdonald College in Quebec in 1938. Throughout the entire period Mr. L. K. Elmhirst has been the president of the Conference.

It was agreed by the Conference that the subscriptions would be \$10 for the two-year period until the next Conference. This subscription will cover the proceedings and four issues of the *Journal of Agrarian Affairs* which are planned for the next two years. This *Journal*, edited by John Maxton, was designated as the official journal of the Conference until such time as the organization is in position to have its own publication. If you wish to subscribe, Professor L. J. Norton, University of Illinois will accept the \$10 and forward it to Mr. Currie, the honorary secretary-treasurer of the Conference. Dean E. C. Young of Purdue University was elected a vice-president of the Conference along with Professor Minderhoud of the Netherlands. Mr. Elmhirst was reelected president and Mr. J. R. Currie, honorary secretary and treasurer.

Five general topics were discussed on the program. On each, one paper was presented, followed by general and mostly informal discussion. The five topics were (1) Movements of Farm Population, opened by Mr. Anonymous who turned out to be John Maxton; (2) The Flexibility of Land Tenure, Capital and Credit Systems to Meet Technical, Economic and Social Developments, opened by President Renne of Montana State College; (3) Effectiveness of Market Mechanism for Adjusting Farming to Public Needs, opened by L. J. Norton; (4) The Place of State Buying and Selling in Free World Trading, opened by Dr. Anthony Gilpin, and (5) The Human Satisfaction of Rural Work and Rural Living, opened by Professor A. W. Ashby of the Agricultural Economic Research Institute, Oxford. In addition, papers were read on some 13 other topics followed by more or less extended discussion.

In an attempt to meet the need for a medium for the expression of views on farm policy, Iowa State College recently has authorized the Iowa State College Press to publish a new quarterly *Journal*, *Farm Policy Forum*. The nature of this journal is clearly shown by the following statement which will be printed on the inside of each front cover: "Farm Policy Forum is published to bring to public attention timely and often controversial articles in the farm policy field. This journal is not an official publication of Iowa State College. Neither the College nor *Farm Policy Forum*

assumes responsibility for the views or opinions expressed in this publication. What the *Farm Policy Forum* does accept is the responsibility for giving those views and opinions an opportunity to appear in its pages."

The responsibility for this Journal is lodged in an Editorial Board of five members. These members are Lauren K. Soth, formerly associate editor of *Iowa Farm Science*, and now on the editorial staff of the *Des Moines Register*; William Davidson, farmer, Stanwood, Iowa; Pearl P. Swanson, Foods and Nutrition Department; Iver J. Johnson, Agronomy Department; and Geoffrey S. Shepherd, Economics and Sociology Department, Iowa State College. The last named is chairman. Members of the Editorial Board are appointed for a term of five years, the terms of the first appointees being staggered so that the term of one member will expire each year. Francis Kutish will be the managing editor.

The Editorial Board is composed of residents of Iowa, chiefly because of the physical difficulty of bringing together for frequent meetings a board drawn from a wider area. But the scope of *Farm Policy Forum* is nationwide and indeed world wide. So the Board is setting up an Editorial Advisory Council of ten members, drawn from all over the United States.

The subscription price of the *Farm Policy Forum* is set tentatively at \$2.00 per year. The first issue is planned, also tentatively, for January, 1948.

Roice H. Anderson, recently with the University of Wyoming, has accepted an appointment as associate professor of Agricultural Economics at Utah State Agricultural College.

G. H. Aull, Head, Department of Agricultural Economics and Rural Sociology, Clemson College, has been appointed by Governor Strom Thurmond of South Carolina as one member of a Committee of Nine to study the state system of public education.

Warren R. Bailey, Division of Farm Management and Costs, BAE, is now stationed at Berkeley, California, after several years of service in the North Central States.

John A. Baker, who transferred from the Farm Security Administration to the Division of Land Economics, BAE, when he was released from the Navy in March 1946, has transferred to the War Department, and is now in Korea with the New Korea Company.

L. M. Bauknight has been appointed assistant professor of agricultural economics at Clemson College.

Quentin Bierman formerly in the Lincoln, Nebraska office of the Division of Farm Management and Costs, BAE, has been stationed at Bozeman, Montana.

Merril K. Bennett, Dean of the School of Social Sciences and Executive Director of the Food Research Institute of Stanford University, was one of six members of a scientific mission to Japan, which arrived at Allied Head-

quarters in Tokyo on July 19 and left on August 28. The purpose of the mission was to review with General MacArthur's staff and the Japanese plans which had been formulated for the future development of Japanese scientific and technological organizations.

Russell W. Bierman formerly of the Division of Farm Management and Costs, BAE, is now with the Federal Reserve Bank of Richmond, Virginia, on a research assignment.

John D. Black of Harvard University is being assisted in his courses this year by Visiting Lecturer Dr. A. G. Black, formerly Governor of the Farm Credit Administration and Dr. Charles D. Hyson, Economist for the Federal Reserve Bank in Boston.

C. F. Bortfeld has returned to North Dakota Agricultural College from where he was on leave to complete his graduate work for a doctor's degree at the University of Minnesota. He has been promoted to the rank of associate professor of agricultural economics.

G. E. Brandow, professor of agricultural economics, Pennsylvania State College, has returned to his duties at the College after a two-month leave to serve as economist for the recently established Northeast Farm Foundation.

Arnold Brekke has joined the staff of the Division of Agricultural Economics of the University of Minnesota as an instructor.

R. G. Bressler, Jr., of the University of Connecticut has been advanced to the rank of professor of agricultural economics. He recently received his doctorate at Harvard University.

John W. Brewster, formerly with the Division of Land Economics, BAE, has accepted a position as professor of social sciences at Kansas State College.

Walter M. Bristol, who is a member of the Department of Agricultural Economics at the State College of Washington, plans to take a year's leave of absence to continue his graduate work at the University of California.

M. E. Brunk was appointed associate professor of marketing at Cornell University July 1 after completing his doctor's degree there. He will be working on fruit marketing problems.

Dee A. Broadbent, associate professor at Utah State Agricultural College has been granted sabbatical leave of absence to complete his work for a doctorate at the University of Illinois.

Mark T. Buchanan, formerly Head of the Department of Agricultural Economics at the State College of Washington, was seriously injured in an air accident, but is recovering and probably will be back in his office before the first of the year. Dr. Buchanan suffered severe burns.

E. L. Butz, E. C. Young and L. S. Hardin from the Agricultural Eco-

nomics Department of Purdue University visited Denmark, Holland, Belgium and France after the international Conference of Agricultural Economists.

H. C. M. Case, Head of the Department of Agricultural Economics at the University of Illinois, has been granted leave of absence for a few months to serve as consultant to the Senate Agricultural Committee. Dr. L. J. Norton will serve as Acting Head of the Department during the interim.

R. Lee Chambliss, Jr., who returned to farm management Extension Service, University of West Virginia, when mustered out of service accepted a position as associate professor at the Department of Agricultural Economics at Virginia Polytechnic Institute on September 15, 1947.

Walter P. Cotton, formerly with the National Cooperative Milk Producers Federation and the Dairy Industry Committee in Washington, D. C., joined the staff of the Department of Agricultural Economics of North Carolina State College on September 15. His new position will be that of associate research professor of dairy marketing.

Joseph S. Davis, Director of the Food Research Institute of Stanford University, attended the first session of the Inter-American Statistical Institute as United States delegate in Washington, D. C., September 6 to 18, 1947. This meeting was held jointly with the 25th session of the International Statistical Institute.

Herrell DeGraff, Professor of Land Economics at Cornell University, served as research economist for the Northeast Farm Foundation during the past summer.

Milton Eberhard, a graduate in agricultural economics from the University of Idaho will be appointed assistant farm economist at the University on October 1. He has been with the National Reclamation Service for the past year and comes to Idaho to work under Flanagan-Hope marketing activities.

George E. Frick has been appointed instructor in agricultural economics to do marketing research at the University of Connecticut.

Charles J. Galpin, 83, died Sunday morning June 1, at his home in Falls Church, Virginia. Dr. Galpin, internationally known rural sociologist, retired in 1934 as head of the Division of Farm Population and Rural Life (Welfare) in the Bureau of Agricultural Economics. His retirement followed 15 years of service in charge of rural life studies in BAE, and 25 years of leadership in the field of rural sociology. During this period he achieved an international reputation, and in 1927 was tendered a special decoration by the King of Belgium in recognition of his contribution to the rural life movement of many countries. In addition to his work in this country, Dr. Galpin made first hand studies of rural conditions in a number of European countries to determine the factors underlying develop-

ment of a stable rural population. Dr. Galpin was a prolific contributor to papers and magazines on questions of rural life. He was author of several books on this subject and supervised preparation of numerous others. He was one of the early leaders in the American Country Life Association and served it and its objectives in many capacities.

C. H. Hammar, who has been on leave from the University of Missouri for the past year to assist with the work on food and agriculture in occupied Germany, is having his leave extended a semester so that he may continue this work.

Meyer A. Girshick has resigned as statistician in the Office of the Statistical Assistant to the Director of the Bureau of the Budget to accept a position with the Douglas Aircraft Corporation.

Peter Hansen, Division of Farm Management and Costs, BAE, spent a six-week period of leave at his father's home in Denmark.

Clifford M. Hardin of Michigan State College visited Denmark, Holland, Belgium, France and Germany after the International Conference of Agricultural Economists. He went under the sponsorship of a group of Michigan farm organizations with a view to obtaining first-hand knowledge of the current European food and economic situation.

A. H. Harrington has been on leave this summer from State College of Washington to finish his graduate work leading towards a Ph.D. He has been at the University of Illinois.

Marshall D. Harris has returned to the Division of Land Economics, BAE, after a year's leave of absence. His leave was devoted to a study of the Genesis of Land Tenure in the United States. The study was centered in the development of our land tenure policies during the colonial period, with particular emphasis on its English heritage. It is anticipated that the study will be reported in book form in about one year.

Karl Hobson joined the staff at the State College of Washington on September 1 as an assistant professor and assistant agricultural economist. Mr. Hobson spent approximately 10 years at the University of Idaho and more recently was with the Bureau of Agricultural Economics at Portland, Oregon.

James E. Honan has accepted a position as economist with the Interstate Milk Producers Cooperative at Philadelphia, Pennsylvania.

Donald C. Horton, principal agricultural economist, in charge, Mortgage Section, Division of Agricultural Finance, Bureau of Agricultural Economics, has completed a summer assignment as lecturer at American University.

Verle R. Houghaboom has been appointed assistant Extension economist in the Department of Agricultural Economics at the University of Vermont.

Vernon L. Israelsen, recently with the U. S. Housing Administration has been appointed as an associate professor of Agricultural Economics at Utah State Agricultural College.

H. Brooks James, professor of agricultural economics, on leave of absence during the past year pursuing graduate work at Duke University, has rejoined the staff of the Department of Agricultural Economics, North Carolina State College.

Sherman E. Johnson, Assistant Chief, BAE, went to Denmark with Peter Hansen as guide after the International Conference of Agricultural Economists.

Ronald W. Jones, Costs and Returns Section, Division of Farm Management and Costs, BAE, is on leave for the academic year at the University of Chicago.

Elmer Kiehl, formerly an assistant county agent of the Missouri Agricultural Extension Service, has been appointed instructor in Agricultural Economics.

E. Fred Koller has returned to his position as professor in Agricultural Economics at the University of Minnesota after a year's leave of absence to conduct a study of financing cooperatives for the National Bureau of Economic Research.

B. H. Kristjanson has been appointed assistant agricultural economist of the Agricultural Experiment Station, North Dakota Agricultural College. He is succeeding J. E. Aakhus, who resigned September 15 to go into private business.

Ellis W. Lamborn, a graduate of Cornell University in June 1947, has accepted an appointment as assistant professor of Agricultural Economics at Utah State Agricultural College.

Ben T. Lanham, Jr., has resigned as associate agricultural economist at the Alabama Polytechnic Institute and will take over the operation and management of his father's farm in South Carolina November 1.

Clarence W. Lokey received in August the first Ph.D. degree to be awarded by the reorganized Department of Agricultural Economics and Sociology at the A. & M. College of Texas. Dr. Lokey has returned to his position as Executive Secretary of the Division of Home Missions and Church Extension, Methodist Church, New York City.

Charles W. Loomer is now associate professor of Agricultural Economics at the University of Wisconsin. Mr. Loomer was previously with the Division of Land Economics, BAE.

J. E. Losey transferred from extension and research to teaching and research in Rural Sociology at Purdue University July 1, 1947. At that time Rural Sociology was transferred from the Division of Education and

Applied Psychology to the Department of Agricultural Economics, and graduate work in Rural Sociology at the Master's level was approved.

H. Allan Luke completed his doctor's degree at Cornell University in September and has joined the staff at the University of Maine as associate professor of marketing.

W. T. McAllister, graduate assistant, Pennsylvania State College, has accepted a position in the Department of Agricultural Economics at Delaware.

Paul S. McComas joined the staff of the University of Kentucky as associate professor in the Department of Farm Economics and assistant economist in the Agricultural Experiment Station effective June 15. Prior to that date, Dr. McComas served as agricultural economist in the Division of Farm Management and Costs, BAE. Previously he had been a member of the United States Armed Forces for two and a half years, and a half year as head of the Department of Agriculture of the University of Alaska.

Albert Duy McNair, one of the early workers (since 1908) in the field of Farm Management, long stationed in Arkansas, died at his home in Dansville, New York, on May 7, in his 81st year.

J. G. McNeely has joined the staff of the Department of Agricultural Economics and Sociology, A. & M. College of Texas. Dr. McNeely was formerly Area Representative for the Labor Branch, PMA, at Lincoln, Nebraska.

L. D. Malphrus, formerly assistant regional program analyst for the Farm Home Administration has accepted a position as assistant agricultural economist on the staff of the South Carolina Experiment Station at Clemson College.

D. A. Marshall has accepted a teaching position at Texas Tech., Lubbock, Texas.

John E. Mason transferred to the Division of Farm Management, BAE, from the Division of Land Economics. He will work on a study of the economic utilization of farm grown foods in livestock production.

W. W. McPherson, agricultural economist of the Bureau of Agricultural Economics, will spend a year at the Harvard Graduate School.

J. F. Miles, associate agricultural economist in the Dairy and Poultry Marketing Section of the Agricultural Extension Service, Washington, D. C., has resigned to accept a position with the South Carolina Experiment Station at Clemson, College.

William H. Nicholls has returned to the University of Chicago after three months of travel in South and Central America. During nine weeks in Brazil, he taught and lectured in Portuguese for the Instituto de Pes-

quizas e Analises Economicas and the Fundacao Getulio Vargas, both of Rio de Janeiro. During his trip, he also travelled extensively in the agricultural regions of Brazil, Argentina, Peru, Costa Rica, and Guatemala.

Don Paarlberg of the Agricultural Economics Department of Purdue University taught Agricultural Economics in the School for Town and County Religious Workers sponsored by Emory University at Atlanta, Georgia, July 2-18.

A. L. Perry, who received a master's degree in the Graduate School at the University of Maine this summer, has joined the staff at the Missouri College of Agriculture as an instructor in Agricultural Economics.

Arthur W. Peterson received a promotion from associate professor to full professor in the Department of Agricultural Economics at the State College of Washington.

Everett E. Peterson on September 1, 1947 was appointed to the position of assistant professor in teaching and research in Farm Management at Michigan State College. Mr. Peterson was formerly with Montana State College and the U. S. Department of Agriculture, Bureau of Agricultural Economics.

Walter Henry Pierce, assistant professor in the Department of Agricultural Economics, North Carolina State College, is on leave of absence under a G.E.B. Fellowship. Professor Pierce will pursue graduate work in the Department of Agricultural Economics at the University of Minnesota.

Clarence E. Pike, formerly with the Farm Credit Administration in Washington, D. C., has joined the staff of the Department of Agricultural Economics, North Carolina State College as extension marketing economist.

James S. Plaxico completed his requirements at Clemson College for the degree of master of science and accepted a position as assistant agricultural economist at Virginia Polytechnic Institute, on July 1, 1947 to do research in farm management.

R. C. Ross, Department of Agricultural Economics, University of Illinois, was a visiting professor at the University of Arkansas where he conducted a summer short course on farm planning for supervisors of G. I. trainees.

Waldo S. Rowan, a 1940 graduate of the University of Georgia has been appointed assistant instructor in the Department of Agricultural Economics at the University of Georgia. He comes to the University of Georgia from the United States Bureau of Agricultural Economics and previous to his employment he served in the Army Air Forces.

Sargent Russell who has been with General Foods Corp. in Caribou, Maine, recently joined the staff of the Department of Agricultural Economics at Massachusetts State College.

Rainer Schickele has become chairman of the Department of Agricultural Economics and Principal Economist of the Agricultural Experiment Station of North Dakota Agricultural College.

Richard G. Schmitt recently joined the Short-Term Section, Division of Agricultural Finance, Bureau of Agricultural Economics, upon return to the Bureau from Iowa State College where he served as instructor in agricultural economics during 1946 and completed requirements for his M.S. degree.

Sidney Schumukler has been appointed assistant professor of Agricultural Economics at the University of Connecticut.

Harold Scoggins has joined the staff of Arkansas University as instructor in the Department of Rural Economics and Sociology. Formerly with the Bureau of Agricultural Economics, USDA, he has been more recently supervisor of the University of Arkansas Tabulating Service Bureau.

L. H. Simerl returned to the University of Illinois September 1 as associate professor of Agricultural Economics. During the last five and a half years Mr. Simerl has been Director of Research for the Illinois Agricultural Association.

L. E. Slater joined the extension staff at Cornell University July 1 as assistant professor of marketing. Slater was formerly comptroller for Cooperative P and C Family Foods, Inc.

J. M. Stepp has been promoted from associate professor to professor of Agricultural Economics at Clemson College.

Christian Stokstad, Division of Farm Management and Costs, BAE, has moved to Boise, Idaho where he will make a study, in cooperation with the Idaho Agricultural Experiment Station, of quick-freezing of vegetables and of the vegetable seed enterprises.

Maurice C. Taylor finished his master's degree in the Department of Agricultural Economics at the State College of Washington in June and carries the title of instructor and junior agricultural economist.

Howard A. Turner retired in June from his position as agricultural economist with the Division of Land Economics, BAE. He had been with BAE since 1912.

Norman Urquhart, formerly with the Division of Farm Management and Costs, BAE, has joined the staff of Western Illinois State College at Macomb.

Arthur W. Van Dyke was recently appointed as association specialist in the extension farm labor program at Cornell University. He replaces J. K. Pasto who has resigned to resume his graduate work.

Karl A. Vary accepted a position as economist with the Federal Reserve Bank of San Francisco.

Harold Walkup is now an instructor and junior agricultural economist in the Department of Agricultural Economics at State College of Washington.

Donald J. Watson who received his master's degree in agricultural economics at Purdue University in June, has accepted a full-time teaching position in Agricultural Economics at Purdue.

Thomas J. Whatley of Alabama has been appointed assistant agricultural economist at the University of Tennessee.

John W. White was appointed head of the Rural Economics and Sociology Department of the University of Arkansas on July 1, 1947. For several years prior to his appointment, Dr. White was Superintendent of the Rice Branch Experiment Station, University of Arkansas, at Stuttgart, Arkansas.

Sheldon W. Williams has been appointed associate professor of agricultural economics at Alabama Polytechnic Institute. Dr. Williams was formerly associate professor of agricultural economics at the University of Vermont.

Walter J. Wills has joined the agricultural economics staff, University of Illinois, as assistant professor. For the past ten years, excepting the time that he was in military service, Mr. Wills has been associated with the Production Credit Bank of St. Louis.

G. B. Wood of the Agricultural Economics Department of Purdue University taught the course in Economics of Cooperation at the 2nd session of the summer school at Colorado A. & M. College, July 21 to August 15.

Noel H. Wood has joined the staff of the University of Arkansas as assistant professor of rural economics and sociology.

Clifford Zuroske, who has been on leave of absence to take advanced work at Purdue and Chicago universities, will return to the State College of Washington to do research work and teaching in the field of work simplification.

The following awards have been made by Harvard University under a grant from the Carnegie Corporation for Agricultural Extension workers:

George E. Lord, Assistant Director of Extension, University of Maine

William Teutsch, Assistant Director of Extension, University of Oregon

Gerald Huffman, County Agent, Butler County, Ohio

Paul E. Nystrom, County Agent Leader, University of Maryland

A. H. Maunder, Supervisor of Extension Programs, University of Nebraska

Floyd E. Rogers, Extension Supervisor, University of Missouri

Leonard Schruben, Office of Agricultural Extension, U. S. Department of Agriculture.

This group will work under the direction of Professors John D. Black and John Dunlop. Professors Black and Dunlop will be assisted in directing

the work of this group by members of the staffs of the Graduate School of Education and the Department of Economics, Government and Social Relations.

The following fellowships in agricultural labor have been awarded under a grant from the Ferguson Foundation to Harvard University:

Melvin R. Janssen, M.S., University of Illinois

Howard Parsons, formerly of the BAE

Alexander Morin, University of Chicago, registered at Harvard University during this past year

Robert Glasgow, recently from Texas A. & M. College and the BAE

George Haythorne, from the Department of Labour, Ottawa, Canada, in charge of farm labor during the war

Barbara Reagen, formerly on the staff of the BAE

In addition, Lloyd Fisher, Research Associate, Institute of Industrial Relations, University of California, and Economic Consultant to U. S. Department of Interior, has been awarded a Jacob Wertheim Fellowship in Industrial Relations and will work with this group.

ANNUAL BUSINESS MEETING AMERICAN FARM ECONOMIC ASSOCIATION

NORTHERN BAPTIST ASSEMBLY, GREEN LAKE, WISCONSIN
SEPTEMBER 11, 1947

Remarks by the President

In the absence of Secretary-Treasurer Norton, Stanley W. Warren, First Vice-President was appointed Acting-Secretary for the meetings of the Executive Committee and the Business Meeting.

Total registration at the meetings was 528, which number does not include those attending meetings but not registered for lodging at the Northern Baptist Assembly.

The President expressed his grateful appreciation to those many individuals who assisted in the formulation of the program.

The reports of the President, the Secretary-Treasurer and the Editor covering the full fiscal year will appear in the February 1948 issue of the JOURNAL OF FARM ECONOMICS. The report of the election tellers will appear in the same issue.

REPORT OF THE EXECUTIVE COMMITTEE

The following actions taken by the Executive Committee at its meeting of September 7, 1947, were brought before the membership at the business session for approval.

The Executive Committee recommends the following resolution for adoption:

The Association shall enter into a joint membership arrangement with the Canadian Agricultural Economics Society on the following basis:

1. Membership in both Associations to be available for \$5.50 a year. Of this \$1.00 is to go to the Canadian Agricultural Economics Society, and \$4.50 to the American Farm Economic Association.

2. Separate memberships to be available, as before on the basis of \$1.00 for the Canadian Agricultural Economics Society, and \$5.00 for the American Farm Economic Association. However, both Associations will encourage joint membership.

3. Proceedings of the Canadian Agricultural Economics Society to be published and sent to all joint members, and to the members of the Canadian Agricultural Economics Society.

4. Canadian Agricultural Economics Society to have full responsibility for this special Proceeding's issue, to pay the cost of it, and to receive revenues from its sale to non-members.

5. Members of the American Farm Economic Association who do not take joint membership shall continue to receive the JOURNAL, but not the special Canadian Agricultural Economics Society Proceedings issue.

6. The President of the Canadian Agricultural Economics Society to be a member of the Executive Committee of the American Farm Economic Association.

Unanimously approved.

The Executive Committee recommends the following resolution for adoption by the membership:

A joint membership shall be established to include the Canadian Agricultural Economics Society, the Western Farm Economic Association, and the American Farm Economic Association. The fee for this membership shall be \$7.00 to be divided as follows: \$1.00 to the Canadian Agricultural Economics Society, \$1.50 to the Western Farm Economic Association, and \$4.50 to the American Farm Economic Association.

Unanimously approved.

The Executive Committee recommends that the Association publish reprints of articles in particular fields in Agricultural Economics in accordance with the following plan:—

The President of the Association with approval of its Executive Committee shall designate the Editor of the JOURNAL OF FARM ECONOMICS and the Editorial Council of the American Farm Economic Association as a special committee to select the subject and title of the volume. This special committee shall also establish general rules as to the size of the volume, its makeup, and general criteria for selection of articles to be reprinted. The special committee shall also select and recommend to the President for his approval, the individual(s) who shall be the editor (or joint editors) of the volume.

The editor(s) shall be responsible for the selection of the articles to be printed in the volume. In this task he shall be given leeway in exercising professional judgment and consulting with professional colleagues. The Editor shall also be responsible for the organization of the volume including the order of the articles. Furthermore, he will be responsible for preparing or arranging for preparation of the bibliography and index. (These recommendations are based upon a report prepared by a committee composed of Sidney Hoos and Henry Keller Jr.)

Unanimously approved.

REPORT OF COMMITTEE ON MERITORIOUS RESEARCH AWARD

Presented by F. V. WAUGH

The Special Awards Committee recommends the following arrangements for the Meritorious Research Award:

1. The Meritorious Research Award will be conferred in recognition of an outstanding piece of research in agricultural economics. It will not be limited to members of the American Farm Economic Association.

2. The Award will be made not oftener than once a year by a Committee of three persons appointed by the President of the American Farm Economic Association, normally for six year terms with one appointment expiring every two years.

3. This Committee shall have full responsibility for making awards. Research publications may be submitted to the Committee by the authors or by members of the Association.

4. The research results considered must have been published during the

two years immediately preceding the year in which the award is made. Publication does not necessarily imply printing, but does imply availability for general use and not merely for private circulation.

5. Four factors will be considered in making the Award: a) originality, b) significance, c) evidence or promise of useful applications, and d) age of authors, preference being given to authors under forty. The Special Awards Committee may propose to the Executive Committee revisions of this provision.

6. The Award will include a suitable memento and a cash honorarium. In cases of joint authorship, each author will receive a memento, and the cash honorarium will be divided equally among the authors. The Executive Committee will determine the character of the memento and the amount of the honorarium.

Respectfully submitted,

J. S. DAVIS

W. C. WAITE

F. V. WAUGH, *Chairman*

Unanimously approved.

REPORT OF COMMITTEE ON SPECIAL GRANTS

Presented by A. C. HOFFMAN

The following recommendations regarding solicitation procedure are submitted for approval:

1. The program for solicitation should be general and should include a good cross section of business firms and enterprises with particular emphasis on cooperatives in order to avoid any appearance of partiality or undue preference toward certain groups.

2. All solicitations should be made on American Farm Economic Association stationery to avoid any confusion.

3. If the committee succeeds in raising more money than the goal of \$5000, they would like to make the following suggestions to the Awards Committee for the distribution of these funds:

a) Consideration might be given to awarding more than one prize annually.

b) Arrangements might be made to assist in printing the prize winning papers for general distribution.

Respectfully submitted,

JULIUS HENDEL, *Chairman*

H. B. ARTHUR

A. C. HOFFMAN

Unanimously approved

REPORT OF COMMITTEE ON LIBRARY AND LIBRARY-CUSTODIAN

Presented by W. H. GLOVER

Objectives

To preserve the writings of the members of the American Farm Economic Association in a way to honor the contributors and encourage all members to record their creative thinking in permanent form.

To assemble a compact and readily available reference library that portrays the growth of the thought of the members of the Association in the field of agricultural economics.

Collections

The specific content of the collections should be determined by the Library-Custodian. In general the collections should be made up of:

1. Permanently bound writings of the members of the American Farm Economic Association, contributed and autographed, insofar as possible. (In general, bulletin and reprint material should be accepted only if permanently bound.)
2. A bound set of the JOURNAL OF FARM ECONOMICS.
3. A limited number of especially valuable or rare, or not readily accessible items in the field of agricultural economics. This section may include manuscripts, bibliographies, or other related materials, and may be purchased.
4. The official records (not in current use) of the American Farm Economic Association.

Library-Custodian

1. Appointment—The Library-Custodian should be appointed by the President of the American Farm Economic Association to serve for a term of not less than four years.
2. Duties—
 - a) Determine the specific content of the collection.
 - b) Canvass all living members of the American Farm Economic Association and families or friends of deceased members to solicit gifts for the library.
 - c) Select and purchase desired items not secured by gift.
 - d) Devise a book-plate or other mark of ownership.
 - e) Secure the use of suitable housing for the collections until such time as the Association may designate headquarters for it.
 - f) Provide care and maintenance for the collections.
 - g) Report acquisitions quarterly in the JOURNAL OF FARM ECONOMICS.
3. Incumbent—We strongly urge that Asher Hobson, who originated the idea of the library, be appointed the first Library-Custodian.
4. Assistance—We recommend that the President of the American Farm Economic Association appoint a committee of three on whom the Library-Custodian may call for special assistance. The members of this committee should serve for four years on a staggered year basis.

Funds

We recommend that the Executive Committee be authorized to seek means of providing a special grant to the amount of \$1000 for this purpose.

Respectfully submitted,

WILBUR H. GLOVER

MARY G. LACY

ANNE DEWEES TAYLOR

Unanimously approved.

The Executive Committee requested authority for the new Executive Committee to meet, in case of need, at Association expense as soon as practical after the election of officers.

Request approved.

The President opened the meeting for discussion of the questions of when and where the next annual meeting should be held. Discussion from the floor indicated a heavy majority in favor of summer meetings. A few expressed the thought that we should not become completely divorced from the other social science associations. The following motion was made:

It is recommended that the Executive Committee plan a meeting for the summer of 1948, to be held at the Northern Baptist Assembly if possible, and that the meeting date be before the opening of schools if possible.

Carried unanimously.

Mr. F. V. Waugh proposed the following resolution:

We, the members of the American Farm Economic Association, wish to express our thanks to the Northern Baptist Assembly for making our stay at Green Lake so pleasant and so comfortable. We liked the food, the sleeping accommodations, the meeting rooms, the swimming pool, and the golf course. We were inspired by the beautiful surroundings. But most of all we greatly appreciated the quiet and efficient help of the management and its toleration of our bad habit of smoking. Agricultural economists are not very religious, but we liked the Northern Baptists, and hope they may be willing to see us again some day.

Unanimously adopted by rising vote.

MINUTES OF MEETING OF EXECUTIVE COMMITTEE

SEPTEMBER 10, 1947

Meeting called to order by President Hobson.

Members present:

Asher Hobson — *President*

Stanley Warren — *Vice President*

Marion Clawson — *Vice-President*

F. V. Waugh — *Past-President*

D. B. DeLoach — *President-elect of Western Farm Economic Association*

W. F. Chown — *Representing Canadian Agricultural Economics Society*

Warren C. Waite — *Editor*

S. ADM.
LIBRARY

The Editor raised the question of the size of the Proceedings issue. The Committee decided that the volume should continue to be limited to 400 printed pages, except as additional pages may be financed by outside contributions.

In response to a request from J. C. Capt, Director, Bureau of the Census to appoint a member of the Association to act on the Special Advisory Committee for the 1950 Census of Agriculture, the Executive Committee nominated John F. Timmons.

STANLEY W. WARREN, *Secretary, pro-tem*

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